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STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

RICHARD SACHSE, DIRECTOR

THIRTY-SIXTH BIENNIAL REPORT OF THE DIVISION OF FISH AND GAME FOR THE YEARS 1938-1940

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STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

RICHARD SACHSE, DIRECTOR

THIRTY-SIXTH BIENNIAL REPORT

OF THE DIVISION OF

FISH AND GAME

FOR THE YEARS 1938-1940

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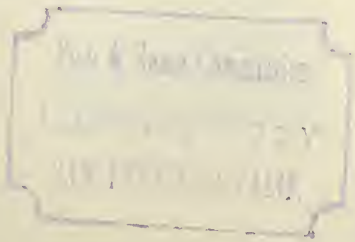

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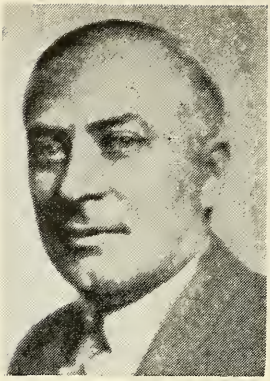
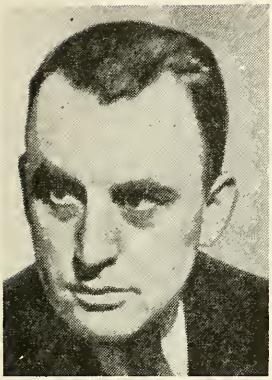
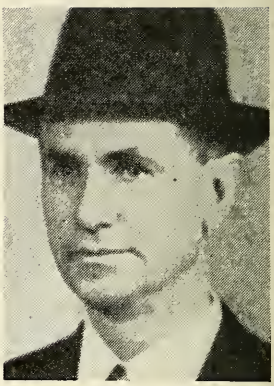


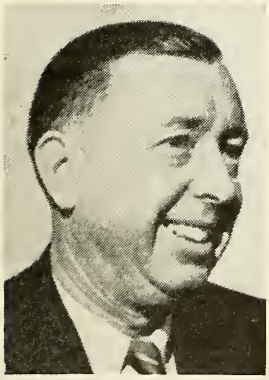
NATE F. MILNOR,
President



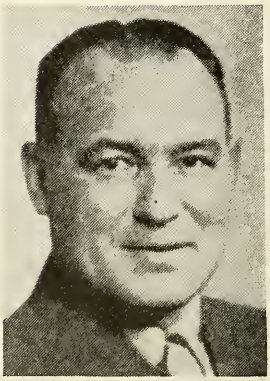
GERMAIN BULCKE



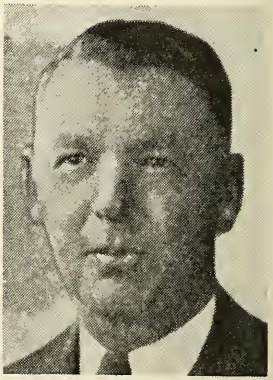
W. B. WILLIAMS



LEE F. PAYNE



LESTER A. McMILLAN



EDWIN L. CARTY

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LIST OF MEN WHO HAVE SERVED AS FISH AND GAME COMMISSIONERS

B. B. Redding
S. R. Throckmorton
J. D. Farwell
R. H. Buckingham
A. R. Dibble
J. D. Redding
T. J. Sherwood
Joseph Routier
J. Downey Harvey
Charles Josselyn
Joseph D. Redding
Ramon E. Wilson
Joseph Morizio
Hugh L. Macniel
William C. Murdock
H. F. Emeric
J. M. Morrison
Alexander T. Vogelsang
C. B. Gould
H. W. Keller
W. W. Van Arsdale
W. E. Gerber
John Birmingham, Jr.
George Stone
F. W. Van Sicklen
M. J. Connell
W. G. Henshaw
F. M. Newbert
Carl Westerfeld
E. L. Bosqui
G. H. Anderson
I. Zellerbach
Ralph Clock
Reginald G. Fernald
George B. Clarkson
Charles R. Bell
J. Dale Gentry
Earl B. Gilmore
E. C. Moore
E. C. Houchin
Charles N. Cotton
A. T. Jergins
Newton G. Booth
Raymond Grey
E. L. McKenzie
Kenneth I. Fulton
Frank W. Clark
Phil S. Gibson
Nate F. Milnor
Germain Bulcke
Edwin L. Carty
Lee F. Payne
W. B. Williams

In Memoriam

It is with much regret the Division reports the following deaths and retirements of members of its staff during the biennium and wishes at this time again to give recognition to the faithful and efficient service rendered by these men.

	Entered Service	*Died*
E. V. Cassell	3/10/10	6/ 8/39
J. H. Groves	8/ 1/18	10/ 2/38
Charles Holzhauser	7/ 1/36	9/ 2/39
William Lippincott	8/ 1/18	12/21/39
S. H. Lyons	7/15/27	9/26/38
George West	4/ 1/08	11/18/38
		Retired
J. H. Gyger	10/ 4/11	11/ 1/39
N. B. Scofield	1897	11/30/39
John J. Shannon	5/ 7/21	6/30/40
R. L. Sinkey	12/ 1/11	10/31/39

LETTER OF TRANSMITTAL

July 1, 1940

To His Excellency, Culbert L. Olson,
Governor, State of California,
Sacramento.

Sir: We, the members of the Fish and Game Commission, are happy to submit our Biennial Report covering the period July 1, 1938, to June 30, 1940.

This Commission, as you know, was appointed by you in September, 1939, and with your assistance and advice, we hope that we have prepared a long-time program which will result in the proper utilization of our fish and game resources.

The following report covers the activities of the various functions within the Division.

We desire to express our appreciation to you, to the State Legislature and to the other State departments for their cooperation.

Respectfully submitted.

Nate F. Milnor, President.
Germain Bulcke, Commissioner.
Edwin L. Carty, Commissioner.
Lee F. Payne, Commissioner.
W. B. Williams, Commissioner.

THIRTY-SIXTH BIENNIAL REPORT

REPORT OF BOARD OF FISH AND GAME COMMISSIONERS TO THE GOVERNOR OF CALIFORNIA

During the biennium, July 1, 1938, to June 30, 1940, the members of the Board of Fish and Game Commissioners of the State of California have, according to your wish, worked unceasingly to the end that California's fish and game be managed in the best interests of its citizens.

Your commission, recognizing the importance of allowing the public a voice in the management of fish and game, has made it a point to invite the sportsmen and the representatives of the commercial fishing and other interests to attend its meetings and to take part in its deliberations. We feel that we have been successful in getting really close to the public that we serve. We regard this as a major accomplishment.

An important part of this public relations program has been the appointment of advisory committees to assist the board in the formulation of policies and regulations in connection with certain specialized phases of fish and game management. The Sardine Advisory Committee, the Hot Creek Fish Hatchery Advisory Committee and the Waterfowl Regulation Advisory Committees have met regularly and have submitted to us many valuable recommendations.

In addition to fostering a better spirit of cooperation between the Division of Fish and Game and the public, your board of commissioners has also worked in closer harmony with the other divisions of the Department of Natural Resources. We played a prominent role at a meeting held at Big Sur, Monterey County, for the purpose of laying plans for a closely integrated departmental program.

We are happy to report that not only has there been an increase in the sale of hunting and fishing licenses, but that California sportsmen have been enjoying the harvest of an increased crop of fish and game.

The big game herd is in a particularly healthy condition as evidenced by a substantial increase in the deer kill during each year of the biennium. The conflict between deer and agriculture continues to present a serious problem in many sections of the State, emphasizing again the crying need for investing the Board of Fish and Game Commissioners with the authority to deal with local problems that can not be taken care of under existing statutes.

The past biennium has witnessed the launching of an entirely new game restoration program in this State—the Pittman Robertson program, with which Your Excellency is already familiar. Approximately $250,000 has been appropriated to this State during the past two years and is being spent under our direction in accordance with the terms of the act.

The board continues to be faced with the problem of providing fishing for an ever increasing army of fishermen in the face of many obstacles. We have taken great pains to study the fish hatchery setup thoroughly and have authorized improvements that will, we feel sure, produce results.

We indorsed a proposed fish screen bill for introduction at the 1941 session of the Legislature which has generally received the unanimous support of sportsmen's organizations, the American Legion, the Califorina State Grange and others. It is hoped that if this measure is enacted into law that a more cooperative and friendly feeling will be engendered between agricultural interests, the sportsmen and the commission.

As a result of failure to secure appropriate action from the fruit and vegetable canners through cooperative measures, your commission instructed that all pollution violations be prosecuted or compliance secured through other means. This action resulted in the wholehearted support of the sportsmen.

For details of these and other activities, we respectfully refer you to the ensuing reports submitted to us by the executive officer and the chiefs of the several bureaus of the Division of Fish and Game.

The Fish and Game Commission wishes to express its appreciation for the aid that it has received from you and from the members of your staff. We could not have accomplished so much had it not been for your never flagging interest in the cause which we serve.

Respectfully submitted.

Nate F. Milnor, *President*
Germain Bulcke
Edwin L. Carty
Lee F. Payne
W. B. Williams

REPORT OF THE EXECUTIVE OFFICER TO THE BOARD OF FISH AND GAME COMMISSIONERS

During the biennium, as your executive officer, I have endeavored to faithfully carry out your wishes and to maintain the Division in an efficient and businesslike manner in accordance with the personnel and financial policies which have already been established.

Since my appointment as executive officer, I have been sincerely interested in establishing an educational program by means of which the sportsmen of the State and others interested in the conservation of California's wild life may be kept advised of just what the Division of Fish and Game is doing and what the reasons are for doing it. Too often we have been criticized in the past for not doing things which we actually are doing at the time, and I feel that we should be completely frank with the sportsmen who are footing the bill. To this end, I have appointed an educational director who at the present time is organizing his program.

I feel that the reorganization of the engineering functions of the Division that has been accomplished during the biennium is a real step forward. Up to the present time, the various bureaus were all carrying on their own engineering work which resulted in a duplication of effort and higher than necessary cost of operation. All of the engineering functions are now centralized in one bureau, the Bureau of Engineering, which was formerly known as the Bureau of Hydraulics.

I wish further to report the following changes in Commission personnel during the biennial period:

Dr. E. C. Moore
Mr. I. Zellerbach
Mr. Newton G. Booth, Jr.
Mr. Raymond Grey
Mr. E. L. McKenzie
Mr. Kenneth I. Fulton
Mr. Frank W. Clark
Mr. Phil Gibson
Mr. Nate F. Milnor
Mr. Germain Bulcke
Mr. E. L. Carty
Mr. Lee F. Payne
Mr. W. B. Williams

Mr. Herbert C. Davis, former executive officer, was replaced September 19, 1939, by Mr. Lester A. McMillan.

LIBRARY

The outstanding development in connection with the library during this period was moving into the new quarters in the later months of 1938. With the assistance of the Patrol Department, the shelves were arranged and labeled. Space at first seemed adequate but it

became necessary to secure three new metal stacks and seven metal cabinets to hold the existing volumes which came from storage at that time. The stacks are within the library proper and the metal cabinets are placed along the office corridor, adding greatly to the appearance of the long hall and the convenience of the library. The Law Library of 711 bound volumes still remains in storage.

The library has increased during this period by the addition of 375 bound volumes ($1,024.02 by purchase; $247.09 by gift), making a total of 2,625 bound volumes with a value of $9,275.59. Seven hundred and eighteen miscellaneous pamphlets were added, making a total of 6,375 scientific and other pamphlets, with an appraised value of $1,059.95. The greater proportion of this material represents gifts. All pamphlets are filed in specially prepared boxes and accessible for use.

Regularly received periodicals number 225, of which 187 are received free, and 48 cover paid subscriptions. The subscription budget has increased a trifle to care for the acquisition of several additional scientific publications deemed necessary for our work, and which could not be obtained free of charge.

Two years' back issues of periodicals, and some worn books, are now ready for binding. It is hoped that provision will be made for this work under the next budget.

Our record of early Fish and Game biennial reports is nearing completion, four rare early numbers having been received during this period. We hope that we may soon obtain those covering years 1872-73 and 1877-79 in order that our file of this valuable historical material may be made complete.

Lending and reference work has increased greatly. Time could not be provided to compile any accurate record of all services rendered; however, during this period the library's current lending circulation list numbers 118 employees from office and field. One hundred and three other names, due to separation from our Division's service, were dropped from our record.

We are grateful to the several United States bureaus and the Special Libraries Association of San Francisco for cooperation, especially in interlibrary loans.

WORKS PROJECTS ADMINISTRATION PROJECT

During the biennium a WPA project operated at the Stanford University laboratory of the California Division of Fish and Game, under its sponsorship. Much aid was rendered to the Bureau of Fish Conservation and to members of the Bureau of Marine Fisheries in the form of mounting of fish scales (preparatory to examination by biologists of the Division), measurement of fish specimens, map mounting, translation of foreign fisheries publications into English, filing and transcription of stream and lake survey and stocking records, cataloging, and general typing, clerical, and statistical work.

(The projects that operated during the biennium are the following:

Work Project No. 7263 began operation June 28, 1937 and closed December 8, 1938.

Work Project No. 10,553 started December 9, 1938, and was continued with supplementary funds from September 25, 1939, to May 23, 1940.

Work Project No. 50-11861 started May 24, 1940, and is continuing at the present time.)

Respectfully submitted.

LESTER A. MCMILLAN.

REPORT OF THE BUREAU OF FISH CONSERVATION

By A. C. Taft, Chief

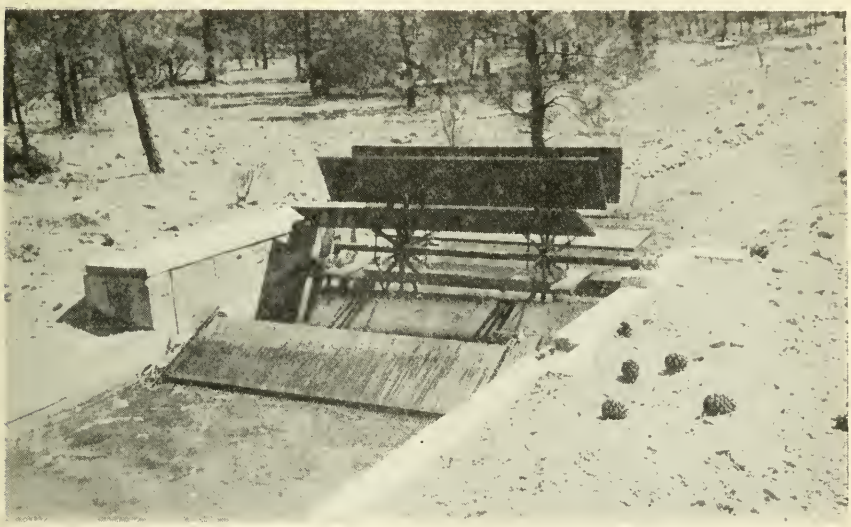
The Division of Fish and Game now operates 23 trout hatcheries and rearing stations, and one bass hatchery and fish rescue station, for the rearing and salvage of fish to be planted in the fresh waters of the State. The annual production of the trout stations is in excess of 30 million fish per year. These same stations also rear about 7 million salmon, most of which are handled at the two hatcheries in the Klamath River area, Fall Creek (No. 20) and Mt. Shasta (No. 21).

This existing hatchery system has developed over a period of some 60 years and as at present constituted it represents facilities resulting from an extended experience in meeting requirements in this State. The personnel on whom the success of the work depends in a large degree also benefits from this long background of experience. Most of the men have come into State service while young and have acquired their technical training through actual experience.

This hatchery system was developed to meet the needs for large numbers of relatively small fish for distribution throughout the State in the less accessible areas and particularly in the many barren streams and lakes of our higher mountain areas. This type of work was very necessary and very valuable and there is still need for this type of production in order to maintain fishing in the bulk of the trout area of the State. However, with the constantly increasing population of California and other changing factors such as the development of roads and increasing interest in outdoor recreation, it has become apparent that certain changes in our plan of operations are now necessary. For many years there has been extended discussion amongst sportsmen's clubs and even within the ranks of fish culturists with regard to the merits of planting fish of various sizes. It has been the consistent view of the Bureau of Fish Conservation that most of the needs of California for trout planting can best be served by the production of fish less than one year old which are planted in relatively large numbers and then attain their growth on the natural food in the streams. At the same time it is apparent to us that this program fails to meet the needs of many accessible and heavily fished areas in the State and for some time our work has been directed toward meeting these new needs.

The production of catchable sized fish for planting in California is made difficult by certain extremes of conditions that exist in the State. First of all, satisfactory water supplies for year round hatchery operation are difficult to find. Most of our hatcheries now in existence utilize stream water which in the nature of the case varies greatly in temperature from summer to winter. At the lower elevations, that are accessible for operation during the winter months, temperatures are excessively high during the summer months and difficulty is encountered in rearing fish there after August 1st. On the other hand,

stations located higher up on these same streams would encounter the difficulty of inaccessibility during the winter months and even though that was overcome it would be found that the water temperatures were so low that during most of the winter periods little or no growth could be obtained. Similar difficulties in other States are met through the use of spring water which usually maintains a more or less uniform temperature throughout the year. Although spring water is abundant in California in certain localized areas such as around Mount Lassen and in the Owens River basin, the balance of the State is practically without springs of sufficient size to furnish hatchery water supplies. The outstanding success of rearing fish to catchable size in a relatively short period at Hot Creek has demonstrated what can be done under favorable conditions and it should be our objective to duplicate those conditions as nearly as possible.



Looking downstream on a parallel bar fish screen
Cleaning bar on screen just above water

In considering the development of a program for rearing fish of larger size to supplement the production of the present hatcheries, two additional difficulties had to be overcome. The first of these was that of obtaining a satisfactory food supply at a more reasonable cost. During the last few years beef liver, which constitutes the basic food for young fry and fingerlings and which should constitute from 30 to 40 per cent of the food of larger fish, has varied in price from 12 to 18 cents per pound delivered at the hatcheries. Since on the average it requires three or more pounds of food to produce a pound of fish, it is apparent that the Division of Fish and Game could hardly afford to supply many fish to the anglers which were produced through the use of food of this cost. Over a period of four years a great deal of experimentation has been done at the Mount Shasta Hatchery to determine the usefulness of certain dried milk and meat meals to supplement the use of fresh meat. This has been worked out to the point now where

such meals can be used to constitute up to 60 per cent of the diet of larger fish at a cost per pound of about 5 cents delivered at the hatchery. We are, therefore, using these meals in considerable quantities at Hot Creek and at Mount Shasta. The large amount of fresh meat required even when meals were used made it imperative that some reduction be obtained in the cost of liver. This was done through working out arrangements whereby the State could obtain condemned fluke livers for use. Under the requirements of the State Board of Health these livers, which are not considered suitable for human consumption, are frozen at relatively low temperatures to kill the flukes and then dyed with a green vegetable substance which indicates that they are not suitable for human use. Practically our entire liver supply has been obtained from this source during the past year at a cost of about 8 cents per pound delivered at the hatchery. It can thus be seen that the cost of our food supply has been reduced by about one-half and we are now in a better position from that standpoint to undertake the rearing of more fish to a larger size.

One other problem that required solution was that of transporting fish of larger size safely and at less cost. During the past two years we have developed aeration equipment which is used on all pickups and trucks which permits safe handling of fish over long distances and also makes it possible to carry more ounces of fish per pound of water.

The solution of these two major difficulties now places the Bureau of Fish Conservation in a favorable position to develop a supplementary hatchery program which will make it possible to supply catchable sized fish to several of the more heavily fished and accessible areas. The present hatchery system can not readily be changed to make it satisfactory for the rearing of these larger fish. The hatcheries are located at points where water temperatures are not satisfactory throughout the year for such work and their actual rearing facilities for the most part consist of troughs which are only suitable for smaller fish. It, therefore, seems apparent that such expansion as is to take place in our hatchery system should be of a different type to supplement the work now being done.

On the attached map, hatcheries and rearing stations have been indicated in three categories; first, existing hatcheries and rearing stations; second, hatcheries recently abandoned due to flood damage, and, third, recommended development for rearing ponds and hatcheries. By referring to the numbers and comparing them with the list given on the accompanying sheets, the names and locations of the various hatcheries can be obtained and also information as to their relative size. Productive capacity is indicated by the number of troughs, tanks or ponds which are available at each station for the rearing of fish.

On the third sheet of this list will be found a section entitled "Recommended Developments." Included therein are the stations or localities in which we believe our program for development should be concentrated. In some instances such as Hot Creek and Fishing Creek proven satisfactory waters now exist, but in most of the others the locations are only tentative and should by all means be proven by the establishment and operation of experimental stations for a period of at least one year before any extensive development is undertaken.

Taking up these recommended developments in order, the Fillmore Experimental Station is now under process of installation. Immediately following the action of the Commission in abandoning the plans for the Lytle Creek Hatchery our efforts were turned toward finding a substitute site and it is believed that the existence of 10 or more second feet of ground water in the bed of the Santa Clara River near Fillmore offers the best present opportunity for development. The water available at that point averages 62 degrees in temperature throughout the year and can be taken onto nearby land under gravity with a conduit system something over 3000 feet in length. According to surveys of the State Department of Water Resources even at the close of the long dry period in 1927 and 1928 the ground water near the point of diversion was only six feet below the surface. However, some caution should be used in making plans for work at this point since chemical analyses show that the water is very heavily laden with a

Looking upstream on a rotary fish screen. Power wheel in front of screen Opening in concrete wall at left is for flushing out moving sand and gravel

variety of mineral elements and it would be impossible to predict in advance whether it would be suitable for the rearing of fish.

One acre of land has been leased for temporary use at a cost of $25 per month from the Sespe Land and Water Company and an experimental station consisting of pumping system, six troughs and two circular tanks, together with a tent house for the attendant, will be constructed immediately. As soon as this experimental work is under way negotiations should be entered into with the Sespe Land and Water Company for a lease and option on a hatchery site of approximately five acres together with the necessary right of way for pipe line. This Fillmore Station would be very satisfactory from the standpoint of geographical location to rear fish of considerable size for planting in the entire southern part of the State. It is readily accessible to the mountainous area of Riverside and San Bernardino counties by way of the highway through Saugus.

The so-called Fishing Creek hatchery site (No. 18) has been under lease by the Division of Fish and Game from the Pacific Gas & Electric Company since 1937. It consists of several acres of land on the shore of Lake Britton, Shasta County, and is held under a 20-year lease at an annual rental of $150. Work was first undertaken there in 1937 and a few experimental troughs were set up to determine if the water supply was satisfactory. It was found that the fish make the same good growth obtained at the Burney Creek Hatchery nearby and that probably the water originates from the same type of source. The water supply consists of over 30 second feet issuing as a spring from a lava bluff above the hatchery site and with a temperature of approximately 48 degrees the year round. It would be the plan in developing this site to utilize the water for the operation of rearing and brood stock ponds in conjunction with the work of the Burney Creek Hatchery which is located about two miles down the lake. We are badly in need of additional facilities for holding rainbow brood stock and also for ponds in which fish of a somewhat larger size could be reared for planting in the heavily fished trout waters from the Feather River north to the Pit River drainage. This hatchery site is located within a few miles of the main highway running north and south from McCloud to Lake Tahoe and could be utilized advantageously for this purpose. Some difficulty has arisen in obtaining a right of way for a pipe line from the water source to the prospective hatchery grounds. This has come about through the fact that one piece of land is held by the United States Indian Service and is now in process of being sold. There is reason to believe that a solution will be found for these difficulties in the very near future.

It will probably be unnecessary to go into any detailed discussion regarding the desirability of developing the Hot Creek rearing ponds in Mono County (No. 11). The Commission has already taken action toward authorizing this work and the money is available. The site and $25,000 toward construction is being supplied by the City of Los Angeles in lieu of the construction of fish ladders at the Grant Lake and Long Valley dams. This hatchery if developed as now planned will be capable of serving the entire Mono-Inyo accessible area with fish of from four to six inches in length.

Items No. 28 and No. 29 under Permanent Development can best be discussed together. The hatchery situation in the north coast area from San Francisco to Eureka has not previously been brought before the Commission. However, it is one of considerable urgency since our hatchery near Ukiah was destroyed in the spring of 1938 and the next hatchery to the north, Fort Seward (No. 4), is very old and does not serve our present requirements satisfactorily. Fort Seward Hatchery was built in 1916, which was prior to the construction of the Redwood Highway. For that reason it was located on the line of the Northwestern Pacific Railroad on the main fork of the Eel River. At the present time the construction of the Redwood Highway has placed the heavy burden of fishing on the South Fork of the Eel and made it the main artery for the distribution of fish in that area. The water supply for the Fort Seward Hatchery is very unsatisfactory and makes it necessary for us to plant the fish out at a small size during late June or early July each year. The minimum of necessary repairs have been

made to the hatchery building and living quarters and if the Division is to avoid expending a rather large sum on rehabilitating this unsatisfactory station it will be necessary to obtain a new site and start experimental work this year. It is, therefore, recommended that a number of sites along the South Fork of the Eel River be investigated this season and active steps be taken to set up one or more experimental stations for operation next fall. One of the most promising sites is near Dyerville on the South Fork and water could be obtained from Canoe Creek which lies within one of the State parks. It is hoped that arrangements can be made for a hatchery site on land which is already owned by the State. This prospective hatchery site is indicated as No. 28 on the map and would replace Fort Seward which is No. 4.

It will be noted from the map that from this previously mentioned station (No. 28) south to San Francisco no hatcheries are now in operation since the Cold Creek Hatchery (No. 24) near Ukiah was destroyed in 1938. Although the streams in these counties—Mendocino, Lake, Sonoma, Napa and Marin are, for the most part, small, they are very heavily fished due to their close proximity to the metropolitan areas around the bay. A supply of spring water is available in the south end of Lake County and it is recommended that negotiations be undertaken for a lease and option so that this water could be tried out in an experimental way for the development of rearing ponds. This would make it possible for us to supply fish of somewhat larger size for certain streams and lakes in Marin, Napa and Lake counties.

It has been apparent for some time that there is great need for a supply of catchable sized fish for planting in the southern San Joaquin-Sierra region. Included in this area are the streams from the San Joaquin south to and including the Kern. It has now been arranged for the Bureau of Fish Conservation to take over the operation of the sportmen's ponds at Kernville, which is shown as No. 31 on the map. These ponds will furnish an ample supply of fish of some size for all of the waters of the lower Kern and its tributaries which can be reached at reasonable transportation costs. There still remain a number of heavily fished streams and areas which are under prospective development in the counties from Tulare County north through Fresno and Madera. The streams included are the Tule River, the Kaweah River, Kings River and the San Joaquin. At the present time we have one large hatchery, No. 3, located on the Kings River, two small seasonal or summer rearing stations, No. 8, Madera Hatchery, and No. 2, Huntington Lake Hatchery. The fourth hatchery for the area is No. 22, Kaweah, which is of medium size and like all of this group mentioned, is designed solely for the rearing of small fish for early planting. The development of the Sequoia and Kings River park areas and the growth of population in the southern San Joaquin make it advisable for us to develop as rapidly as possible facilities for rearing fish of larger size. In this entire area there is practically no spring water of consequence. Such springs as exist are small in volume, cold in temperature and located at rather high elevations. With a view to possible use of well water of suitable temperature, some investigation has already been made. At the present time we have found one well near Visalia which has a temperature of 57 degrees and so located that water pumped therefrom could advantageously be used

for irrigation below. This station would be entirely experimental since many details of operation and water use are new and the outcome could, therefore, not be predicted. However, the urgent need for this new type of rearing facility is so great that considerable experimental work would be justified.

Fish Cultural Stations, California, 1938-1940

In summary, the recommendations for expansion of the hatchery system consist for the most part of pond stations where fish of a larger size could be reared for use in heavily fished, accessible areas. The only exception is that of No. 28 which would provide for the replacement of a hatchery which is now old and in poor repair and poorly located to serve our needs, but even in that case rearing ponds should be included in the new construction. It is believed that if the devel-

opments given herein materialize our present hatchery system would be expanded in such a way as to best serve the future needs of trout fishing in California.

STATE FISH HATCHERIES AND REARING STATIONS IN OPERATION—1940

Alpine County:

1. Alpine Hatchery, located near Markleeville (seasonal)
   30 troughs.

Fresno County:

2. Huntington Lake Hatchery, located near Lakeshore (seasonal)
   6 troughs, 10 tanks, 1 pond.
3. Kings River Hatchery, located 56 miles east of Fresno
   100 troughs.

Humboldt County:

4. Fort Seward Hatchery, located near Alderpoint
   100 troughs.
5. Prairie Creek Hatchery, located near Orick
   80 troughs, 4 tanks.

Inyo County:

6. Mount Whitney Hatchery, located near Independence
   120 troughs, 2 tanks, 5 ponds.

Kern County:

31. Kern Hatchery
    8 ponds.

Lassen County:

7. Lake Almanor Hatchery, located near Westwood
   96 troughs, 10 tanks, 4 ponds.

Madera County:

8. Madera Hatchery, located near Bass Lake (seasonal)
   6 troughs, 10 tanks.

Mariposa County:

9. Yosemite Hatchery, located in Yosemite National Park
   52 troughs, 4 tanks.

Mendocino County:

24. Cold Creek Hatchery, located near Ukiah (destroyed by flood, 1938).

Mono County:

10. Fern Creek Hatchery, located near June Lake (seasonal)
    30 troughs.
11. Hot Creek Hatchery, located near Mammoth
    12 troughs, 12 raceways, 7 ponds.

Placer County:

12. Mount Tallac Hatchery, located near Lake Tahoe
    52 troughs, 17 tanks.
13. Tahoe Hatchery, located near Tahoe City
    64 troughs.

Plumas County:

14. Feather River Hatchery, located near Clio
    60 troughs, 2 ponds.

Sacramento County :

15. Central Valleys Hatchery, located near Elk Grove
19 ponds, 2 tanks.

San Bernardino County :

16. Forest Home Hatchery, located near Mentone and Forest Home (damaged by flood, 1938).

Santa Cruz County :

25. Big Creek Hatchery, located near Davenport (damaged by flood, 1940).
17. Brookdale Hatchery, located near Brookdale
40 troughs, 7 ponds.

Shasta County :

18. Burney Creek Hatchery, located near Burney
100 troughs, 4 ponds.

Sierra County :

19. Yuba River Hatchery, located near Camptonville
30 troughs.

Siskiyou County :

20. Fall Creek Hatchery, located near Copco
116 troughs, 9 ponds.
21. Mount Shasta Hatchery, located near Mt. Shasta City
464 troughs, 52 ponds.

Tulare County :

22. Kaweah Hatchery, located near Three Rivers
60 troughs.

Tuolumne County :

23. Basin Creek Hatchery, located near Tuolumne
80 troughs, 9 tanks.

Recommended Developments

26. Fillmore experimental trout rearing station
2 tanks, 6 troughs, 4 ponds.
27. Fishing Creek rearing ponds.
Plans not yet drawn.
11. Hot Creek rearing ponds and hatchery
22 ponds, 30 trough-hatchery.
28. Replacement for Fort Seward Hatchery (No. 4).
29. Lake County rearing ponds and small hatchery.
30. Sequoia rearing ponds.

A detailed list of the fish plantings made during the biennium will be found in the appendix to this report. This includes both fish reared in the hatcheries and those salvaged through fish rescue work.

Following is a list of the fish cultural stations operated by public agencies in California since they were first established in 1870. This listing has been prepared by Mr. Louie Phillips, Hatchery Inspector, and is based on a similar list prepared by Mr. W. H. Shebley in 1922. Mr. Phillips has made some corrections and has brought the list up to date.

This report is of great interest because it very pointedly brings out the hazards that are involved in establishing fish cultural stations in California. Although many of the hatcheries were designedly experimental, the fact that 51 hatcheries have been constructed and later

abandoned shows that many difficulties were encountered. This is more than twice as many as are now in operation and about the same ratio holds true for egg collecting stations. This clearly demonstrates that satisfactory hatchery sites are difficult to find in California and indicates that in the future even greater care should be taken and all possible information should be obtained before new stations are established. Wherever possible temporary and experimental facilities should be thoroughly tried out before any permanent investment is made.

PUBLIC HATCHERIES AND EGG COLLECTING STATIONS OPERATED IN CALIFORNIA, 1870-1940

Name	*Location*	*Years of Operation*
Acclimatization Society	City Hall, San Francisco	1870-1871
State Hatching House	University of California, Berkeley, California	1870-1877
Baird Fish Hatchery (U.S. Bureau of Fisheries)	McCloud River, Shasta County	1872
	(Rebuilt)	1881-1883
		1888-1920
Clear Lake Experimental Hatchery	Kelsey Creek, Lake County	1873-1874
Frazier Hatchery	Squaw Creek, Placer County	1875-1880
San Leandro Hatchery	San Leandro, Alameda County	1878-1883
Hurley Hatchery	Tahoe City, Placer County	1880-1888
Woodsen Egg Collecting Station	Fort Bidwell	1881-1884
Shebley Hatchery	Shebley's Station, Nevada County	1883-1888
Phipps Hatchery	Lake Tahoe, El Dorado County	1884-1888
Hat Creek Hatchery	Carbon, Shasta County	1885-1888
Mount Shasta Hatchery	Mt. Shasta, Siskiyou County	1888-
Tahoe Hatchery (new hatchery built in 1920)	Tahoe City, Placer County	1889-1891
		1894-1920
		1920-
Fort Gaston Fish Hatchery (U. S. Bureau of Fisheries)	Trinity River, Hoopa Indian Reservation, Humboldt County	1889-1898
Shovel Creek Egg Collecting Station	Klamath River, near Beswick, Siskiyou County	1889-1912
Glen Ellen Fish Hatchery		1929-1934
(Private hatchery controlled by State)	Glen Ellen, Sonoma County	1890-1891
Del Monte Fish Hatchery (Private hatchery controlled by State)	Del Monte, Monterey County	1890-1891
Bear Valley Hatchery	Olema, Marin County	1891-1894
Alma Fish Hatchery (Private hatchery controlled by State)	Alma, Santa Clara County	1892-1893
Korbel Fish Hatchery (U. S. Bureau of Fisheries)	Redwood Creek, Humboldt County	1893-1897
Independence Lake Fish Hatchery and Egg Collecting Station	Independence Lake, Nevada County	1893-1894
Redwood Creek Egg Collecting Station (U. S. Bureau of Fisheries)	Redwood Creek, Humboldt County	1893-1897
Battle Creek Fish Hatchery (U. S. Bureau of Fisheries)	Battle Creek, Shasta County	1895-

Name	*Location*	*Years of Operation*
Wawona Fish Hatchery	Big Creek, Wawona, Mariposa County	1895-1928
Mount Tallac Fish Hatchery	Taylor Creek, El Dorado County	1895-1909
New Mount Tallac Fish Hatchery	Taylor Creek, El Dorado County	1909-
Price Creek Fish Hatchery	Grizzly Bluff, Humboldt County	1897-1916
Ukiah Fish Hatchery	Ukiah, Mendocino County	1897-1927
Mears Creek Egg Collecting Station	Near Sims, Shasta County	1898-1899
Hazel Creek Egg Collecting Station	Near Sims, Shasta County	1898-1899
Cottonwood Creek Egg Collecting Station	Hornbrook, Siskiyou County	1900-1938
Campbell Creek	McCloud River, Shasta County	1901
Squaw Valley Creek	McCloud River, Shasta County	1901
Howe Creek Egg Collecting Station	Eel River, Humboldt County	1902
Mill Creek Fish Hatchery (U.S. Bureau of Fisheries)	Los Molinos, Tehama County	1902-
California State Verdi Fish Hatchery	Verdi, State of Nevada	1902-1905
Edgewood Experimental Station	Upper Shasta River, Siskiyou County	1906-1907
Shasta River Egg Collecting Station	Near Yreka, Siskiyou County	1907-1908 1937-
Bouldin Island Striped Bass Hatchery	Bouldin Island, San Joaquin County	1907-1909
Glen Alpine Fish Hatchery	Glen Alpine Springs, El Dorado County	1908-1913
Bogus Creek Egg Collecting Station	Klamath River, Siskiyou County	1910-
Klamathon Egg Collecting Station	Near Hornbrook, Siskiyou County	1910-
Snow Mountain Egg Collecting Station	Eel River, Mendocino County	1910-
Sacramento Experimental Salmon Hatchery	Sacramento	1911-1913
Brookdale Fish Hatchery (Operated by County 1905-1912) (Operated by State 1912)	Brookdale, Santa Cruz County	1912-
Scott Creek Egg Collecting Station (Operated by County 1905-1912)	Santa Cruz County	1912-
Willow Creek Egg Collecting Station	Thrall, Siskiyou County	1912
Camp Creek Egg Collecting Station	Klamath River, Siskiyou County	1912-1934
Bear Lake Fish Hatchery	Big Bear Lake, San Bernardino County	1914-1932
Gottville Egg Collecting Station	Klamath River, Siskiyou County	1914
North Creek Egg Collecting Station	Big Bear Lake, San Bernardino County	1915
Burney Creek Egg Collecting Station	Burney Creek, Shasta County	1915
Ward Canyon Egg Collecting Station	Copco, Siskiyou County	1915
Fort Seward Fish Hatchery	Alderpoint, Humboldt County	1916-
Marlette-Carson Fish Hatchery	Carson City, Nevada (Operated by California Fish and Game Commission)	1916-1917

Name	*Location*	*Years of Operation*
Yuba City Experimental Shad Hatchery	Yuba City, Sutter County	1916
Almanor Fish Hatchery	Lake Almanor Dam, Plumas County	1916-1919
Domingo Springs Fish Hatchery	Chester, Plumas County	1916-1937
Rae Lakes Egg Collecting Station	Rae Lakes, Fresno County	1917-1927
Bryan's Rest Egg Collecting Station	Bryan's Rest, Humboldt County	1917
Mount Whitney Fish Hatchery	Independence, Inyo County	1917-
Cottonwood Lakes Egg Collecting Station	Cottonwood Lakes, Inyo County	1918-
Yosemite Experimental Hatchery	Yosemite Valley, Mariposa County	1918-1920
Clear Creek Fish Hatchery	Westwood, Lassen County	1918-1930
Feather River Fish Hatchery Experimental	Gray Eagle Creek, Plumas County	1918
North Creek Fish Hatchery	Big Bear Lake, San Bernardino County	1919-1928
Fall Creek Fish Hatchery	Copco, Siskiyou County	1919-
Kaweah Fish Hatchery	Three Rivers, Tulare County	1919-
Metcalf Creek Egg Collecting Station	Big Bear Lake, San Bernardino County	1919-
Bull Creek Egg Collecting Station	Dyerville, Humboldt County	1919
Grout Creek Egg Collecting Station	Big Bear Lake, San Bernardino County	1919-
Warner Creek Egg Collecting Station	Warner Creek, Plumas County	1920-1937
Eel River Egg Collecting Station	Branscomb, Mendocino County	1920-1921
Feather River Hatchery	Johnsville, Plumas County	1921-1923
San Joaquin Experimental Station	Auberry, Fresno County	1921
Upper Truckee River Egg Collecting Station	El Dorado County	1921-
Taylor Creek Egg Collecting Station	Taylor Creek, El Dorado County	1921-1935
Blackwood Creek Egg Collecting Station	Lake Tahoe, Placer County	1921-1932
Ward Creek Egg Collecting Station	Lake Tahoe, Placer County	1921-1924
Feather River Fish Hatchery	Clio, Plumas County	1924-
Shackleford Creek Egg Collecting Station	Scott River, Siskiyou County	1925-
Beaver Creek Egg Collecting Station	Klamath River, Siskiyou County	1925-1937
Blackwood Creek Hatchery	Lake Tahoe, Placer County	1925-1937
Rush Creek Egg Collecting Station	Rush Creek, Mono County	1925-
Fern Creek Hatchery	Near June Lake, Mono County	1926-
Butt Creek Egg Collecting Station	Lake Almanor, Plumas County	1926-1927
Gull Lake Egg Collecting Station	Gull Lake, Mono County	1933-1935 1926-1936
Burney Creek Fish Hatchery	Burney, Shasta County	1927-
Big Creek Fish Hatchery	Big Creek, Santa Cruz County	1927-1939
Yosemite Fish Hatchery	Yosemite Valley, Mariposa County	1927-
Cold Creek Fish Hatchery	Ukiah, Mendocino County	1928-1937
Mormon Creek Experimental Hatchery	Sonora, Tuolumne County	1928-1930
Kern River Experimental Hatchery	Kernville, Kern County	1928

Name	*Location*	*Years of Operation*
Kings River Experimental Hatchery	Kings River, Fresno County	1928-1930
Prairie Creek Experimental Hatchery	Orick, Humboldt County	1928
Prairie Creek Egg Collecting Station	Orick, Humboldt County	1928-1937
Mud Creek Egg Collecting Station	Lake Almanor, Plumas County	1928-
Santa Ana River Station	Forcee Creek, San Bernardino County	1928-1929
San Gabriel River Station	Coldbrook Camp, Los Angeles County	1928-1929
Yuba River Hatchery	North Fork Yuba River, Sierra County	1929-
Walker River Egg Collecting Station	West Walker River, Mono County	1929 1931-1932
Bucks Lake Egg Collecting Station	Bucks Lake, Plumas County	1929-1931
Ballards Reservoir Egg Collecting Station	Canby, Modoc County	1930
San Gabriel River Hatchery	Rincon Flats, Los Angeles County	1930-1932
Snow Creek Fish Hatchery	Snow Creek, Riverside County	1930-1932
Santa Ana River Hatchery	Sevenoaks, San Bernardino County	1930-1932
Lake Hemet Egg Collecting Station	Lake Hemet, Riverside County	1930
Madera Hatchery	Bass Lake, Madera County	1930
Lake Arrowhead Egg Collecting Station	Lake Arrowhead, San Bernardino County	1930-1932 1935 1940-
Kings River Hatchery	Kings River, Fresno County	1930-
Lake Almanor Hatchery on Benner Creek	Chester, Plumas County	1930-1933
Chester Egg Collecting Station	North Fork Feather River, Plumas County	1931-1937
Walker Lake Egg Collecting Station	Walker Lake, Mono County	1931-
Huntington Lake Hatchery	Huntington Lake, Fresno County	1931-
Butte Lake Egg Collecting Station	Butte Lake, Lassen County	1931-1934
Alpine Fish Hatchery	Markleeville, Alpine County	1932-
Forest Home Fish Hatchery	Forest Home, San Bernardino County	1932-1940
Friant Bass Hatchery	Friant, Fresno County	1932-1937
Hagen Flat Egg Collecting Station	Pit River, Shasta County	1932-1933
Kosk Creek Egg Collecting Station	Pit River, Shasta County	1933-1934
Hamilton Branch Egg Collecting Station	Lake Almanor, Plumas County	1933-1936
Hot Creek Hatchery	Mono County	1933-
Deep Creek Egg Collecting Station	Pit River, Shasta County	1934-
Blue Lakes Egg Collecting Station	Alpine County	1934-
Independence Lake Egg Collecting Station	Nevada County	1934-1935
Marlette Lake Egg Collecting Station	State of Nevada	1934-1939
Hobart Creek and Lake Egg Collecting Station	State of Nevada	1934-1939
Lake Eleanor Egg Collecting Station	Yosemite National Park	1934-
Tompkins Creek Egg Collecting Station	Scott River, Siskiyou County	1935

Name	*Location*	*Years of Operation*
San Lorenzo River Egg Collecting Station	Brookdale, Santa Cruz County	1935-
Shasta River Dam Egg Collecting Station	Yreka, Siskiyou County	1936
Central Valleys Bass Hatchery	Elk Grove, Sacramento County	1937-
Kirman Lake Egg Collecting Station	Mono County	1937-
Little River Egg Collecting Station	Humboldt County	1938-
Pasadena Reservoir Egg Collecting Station	San Gabriel River, Los Angeles County	1938-1939
Mountain Home Hatchery	San Bernardino County	1938-1940
Heenan Lake Egg Collecting Station	Alpine County	1939-
Lake Arrowhead Hatchery	Lake Arrowhead, San Bernardino County	1940-
Fillmore Experimental Hatchery	Fillmore, Ventura County	1940-
Kern Hatchery	Kernville, Kern County	1940-

POLLUTION DETAIL

PAUL A. SHAW, In Charge

The program and work of the Pollution Detail, outlined in the 35th Biennial Report, have been continued and expanded during the present biennium to include a personnel of three from the Bureau of Fish Conservation and eight from the Bureau of Patrol.

OIL

The Detail has maintained a frequent and more complete patrol covering areas where production, refining, loading, shipping, storage and use of oil and petroleum products constitute a potential hazard to aquatic life in State waters. In this work the cooperation of Federal enforcement agencies has been extended; patrol by boats and planes, together with effective backing on enforcement having been of inestimable benefit in the investigation and control of pollution from this source. Many new and modern oil separating units, particularly at the car loading, tank cleaning and roundhouse stations of the railroads have been constructed during the period covered by this report with resulting improvement to aquatic conditions. A further step, to remove suspended solids, hazardous chemicals and final traces of oil has recently been taken, on our insistence, by a concern handling oil field waste waters where an installation costing over $100,000 is now being completed for this purpose.

MINING

Pollution resulting from mining has, next to oil, required the most active efforts of this Detail. Repeated inspections, suggestions on proper control measures and emphasis on protection of recreational values as well as fish life, combined with a more insistent public demand, has served to initiate a greater degree of cooperation on the part of mining company officials than has been evident in past years. Thus, the improvements have largely been through suggestion, request and the weight of public opinion rather than enforcement, but this method is inadequate for the minority who delay action until forced to do so. The same situation applies to the Klamath and Trinity area where the legislation now in effect (Section 482) does not guarantee stream clarity and efforts to preserve suitable conditions for recreation and fishing depend on cooperative work and good will rather than compliance with the law.

This situation emphasizes the need of factual data to establish more definitely the damage caused by pollution from placer mining, on which a study will soon be under way, and also initiates the thought that legislation to control pollution from this source would be justified on the basis of damage only to the recreational use of State waters. Control of tailings from quartz mills is less difficult, potential damage

being more definitely established, and permanent impounding areas have been constructed and put in satisfactory operation at many additional mills during the biennium.

A study to determine the extent and methods of controlling future damage to waters of the Shasta Dam reservoir by tunnel drainage contaminated with copper and acid from abandoned mines will be concluded shortly after the present biennium, the data now indicating that a project to exclude air by sealing tunnel entrances would be effective.

FOOD AND BEVERAGE PLANTS

The food and beverage industries produce wastes causing pollution of a different type but equal in importance to that from oil and mine tailings. The large contributors to pollution in this classification are the fruit, vegetable and fish plants, wineries, distilleries, beet sugar refineries and milk products. Two factors have been primarily responsible for delays in securing complete remedial measures to eliminate pollution from these sources. First, several of the large industries have had sufficient influence to request and secure deferred action. Fortunately, during the present biennium the Fish and Game Commission took a firm stand authorizing strict enforcement of pollution laws. Second, complete remedial and treatment measures are dependent on further research and investigation, sufficient data not being available for the design and installation of proper pollution control facilities. In this connection, while the burden of responsibility rests with the industry, it is essential that this Division be familiar with suitable methods, and conduct sufficient research of a practical character to offer suggestions to the industry, thus avoiding further delays when it is claimed that treatment methods are not available. Employment of a Junior Sanitary Engineer, recently approved by the Fish and Game Commission, and construction of adequate laboratory facilities are urgently needed to carry on this program.

Notwithstanding the difficulties above stated, material progress has been made in reducing pollution from the food and beverage industries. Celery packers in the Terminous area installed flume, elevator and bin units at a cost of $50,000 for handling waste celery; this material now being taken away by truck and utilized for stock feed. Wineries in the Lodi area constructed sumps and land disposal areas for still slops following a severe fish mortality from pollution of the Mokelumne River. Asparagus packing and canning plants, together with a few peach and tomato canners have eliminated a portion of the garbage like wastes by land disposal, but further remedial measures are urgently needed. Several sugar refineries improved land areas for waste disposal and another refinery is now installing a treatment plant. On the whole, pollution from sugar refinery wastes was greatly reduced during the biennium. Pollution from milk product plants has been decreased over former years, but seasonal inspections are still necessary to safeguard certain streams during summer and fall periods of low water flow.

Control of pollution from fish canning and reduction plants concentrated at San Diego, Terminal Island, Monterey and the San Francisco Bay areas, estimated to produce wastes equivalent to the raw sewage of 2,500,000 persons at Monterey and 5,000,000 persons in the

San Francisco Bay area during days of peak operation, has only been effected to a minor degree, the principal improvement being removal of fish scales and large fish particles from purse seine bilge water and plant effluents. Greater oil recovery and reduction of solids in press liquor has also been provided at a few plants. However, steps to eliminate pollution from all plant effluents are progressing with research under way by the City of Los Angeles, various fish plant operators and private engineering concerns.

SEWAGE AND GARBAGE

Pollution of State waters from sewage is still a serious problem. Data contained in a recent Federal bulletin reveals that 10 per cent of the investment needed throughout the Nation for abatement of sewage pollution is required here in California. While laws relative to sewage disposal do not come under the jurisdiction of the Division of Fish and Game, the Pollution Detail indirectly has been active in advocating, requesting and securing sewage pollution abatement in a number of instances. Complete treatment units have been installed at several smaller communities and the cities of San Diego, Los Angeles, Oakland and Sacramento have plans and programs well under way for sewage disposal improvements.

Garbage and similar refuse which periodically pollutes many water areas in California, causing severe complaints, is not specifically prohibited under the pollution act enforced by the Detail. Certain sections of the Public Health Code cover this matter adequately, but the Department of Public Health does not have the personnel for enforcement. A plan is therefore being considered, whereby officers of the Pollution Detail would be authorized to enforce these sections of the Health Code, and if adopted a marked decrease in harbor, beach and stream pollution from this source can be anticipated during the coming biennium.

MISCELLANEOUS

Definite aquatic improvement has also been effected during the biennium from control measures installed at the request of this Detail at many plants of other types such as sawmills, chemical and manufacturing concerns.

COURT CASES

During the biennium, under the efficient supervision of Warden C. L. Towers, 134 cases were prosecuted with fines totalling $26,355, of which amount $20,280 was paid in cash. In this connection the installation of short wave radios has been of great value in answering calls immediately and securing proper evidence. The use of motion picture cameras has also greatly aided in collecting convincing evidence.

REPORT OF THE BUREAU OF GAME CONSERVATION

By J. S. Hunter, Chief

The work of the Bureau of Game Conservation in assisting in the management of game in our State has grown year by year with the taking over of new problems the solution of which will add to the game supply and assure posterity of a continuation of the pleasures of field sports for years to come. Conditions, generally, are satisfactory but there are many problems that must be worked out before we can rest on our oars and say our work is finished.

WATERFOWL

There is no doubt that the number of ducks has increased during the past several years. This is due to the work of the various interested agencies that have brought about better protection and breeding conditions. The work of the Federal Government through the Fish and Wildlife Service can not be too highly commended nor can the accomplishments of Ducks Unlimited in improving conditions in the north go unmentioned. Our own part in setting aside of sanctuaries where millions of birds have found security during the open season and have been able to survive and go to their northern breeding grounds, must not be overlooked.

There is, however, work yet to be done. Duck disease, lead poisoning, and other causes take a great toll which may or may not be prevented. We must carry on and make every effort to find a cure for these destructive agencies. Breeding areas in our State must be provided. It is evident there can be no great increase in breeding areas in the wintering localities, but there is a wonderful opportunity to better conditions in the real duck breeding areas in the northeastern part of the State.

WATERFOWL REFUGES

Ducks by the millions have been using our waterfowl refuges as loafing and feeding areas. Year by year their numbers are increasing. The first birds arrive in August and increase so that by the end of the season there are thousands upon thousands of birds. These birds have successfully escaped the hunters' shotguns and will continue on to their northern breeding grounds. Were it not for these protected areas the duck situation in California would be in a serious condition.

It has been possible during the past two years to maintain a satisfactory water area on all the refuges. At Los Banos during the duck season we could have used more water, but with the development of the interior valley project, the water situation on this refuge will be more satisfactory. During September, 1939, in Imperial Valley, torrential rains flooded the refuge but caused no damage. In the Spring of 1940 flood conditions prevailed in the Sacramento Valley. During

the flood of 1937 we thought we had seen the highest water we would ever have. However, the 1940 flood was four feet higher, even exceeding the record flood of 1907. The newly finished superintendent's house on Gray Lodge Refuge had been built, we believed, so that the floor would be at least 18 inches above the highest flood. At its peak the water was 19 feet deep in the house. Fortunately, very little damage resulted.

QUAIL

The status of our chief upland game bird is not satisfactory. There remains much work to be done and it is for this reason that we have undertaken an extensive study with Pittman-Robertson funds of the quail problem and we hope it will bring about results satisfactory to the thousands of our sportsmen. Whether the situation is caused by disease can not be stated at the present time, but we are aware of conditions and will carry on until we know the cause and, we hope, the cure. Excellent work can be done in improving quail conditions by the development of water, feed, cover and roosting places and in trapping birds in heavily stocked localities and transferring them to areas that are underpopulated.

DOVES

In certain parts of California the mourning dove is the main game bird. In years past when the season opened well ahead of September, doves were being reduced in numbers but since September 1st was made the opening date, the supply has remained constant and in sections has increased. In the greater part of the State, unless the season opens the first of September, there is very limited hunting. The nesting season is then over and the birds leave the locality where they have been abundant. Probably the greatest concentration area is in Imperial Valley. In that section the season can be opened the first of October and the hunters be assured of good shooting on practically any day of the season.

PIGEONS

The success of the pigeon hunter depends greatly upon the abundance of feed. In the areas commonly frequented by these birds, unless there is a good supply of acorns and berries, there will be few birds. Usually the best hunting is in the lower central coast counties. Last year in the Pleyto section in southern Monterey and northern San Luis Obispo counties, more than 20,000 pigeons were taken during the open season. In doing so hunters used more than 14,000 boxes of shells. Pigeons are not the easiest of game birds to hit. We are sure that this kill did not injure the supply as the birds were as abundant by the end of the season as at the beginning.

PHEASANTS

The ring-necked pheasant can now be considered as a thoroughly established game bird in our State, particularly in that section where rice growing is carried on. No less than 125,000 birds are taken annually. In that part of the Sacramento Valley covered by flood waters in the Spring of 1940 there was a heavy loss of birds. However,

the species is a prolific breeder and under favorable conditions will recover rapidly.

SAGEHEN

There has been a very encouraging increase in sagehens during the past several years in Modoc, Lassen and Mono counties. It is hoped that with the attention now being given them, they will continue to increase so it will be possible to put the species back on the list that can be taken by hunters.

DEER

There are few States in the Union that can offer more in the way of deer hunting than we can in California. With a season extending through August to the middle of October, with a limit of two deer, and with an excellent supply to draw from, what more could the hunter desire? Since the deer tag law was adopted in 1927 the deer harvest, according to postcard returns, has been more than doubled and there are few parts of the State where conditions justify worry. On the other hand, there are sections where it seems deer may be too abundant and it may be necessary to reduce their numbers. Crop protection from deer is becoming a serious problem.

ANTELOPE

Previous to the record-breaking cold winter of 1936-37 the antelope herd increased to such an extent that we believe it would soon be possible to have a limited open season. However, so many were winter killed there was a serious setback and an open season must be delayed until complete recovery has been made. Close watch will be kept on the antelope population. During the winter when the animals bunch and when climatic conditions permit, a census will be taken. Last year a census taken in February indicated there were somewhere near 6,000 head in Modoc and Lassen counties.

ELK

The valley elk that were moved to Owens Valley have continued to increase. When Owens Valley was not farmed the elk were welcome and were not a problem but with the change in the agricultural program of the Los Angeles owners, crop protection from elk is serious. Plans are under way which, if perfected, will lead to the fencing of an area where the elk may range without disturbing anyone.

The 200 or 300 Roosevelt elk that are found in the redwood country in Humboldt County also continue to give some trouble to the agricultural interests. It is hoped that arrangements can be made whereby this most interesting species can be held in some park area where damage to crops will be of little consequence.

The elk on the refuge in Kern County are slowly increasing. Some loss in the herd is occasioned each year by the fact that certain morons think it is sport to sneak up on the outside of the fence and shoot at the animals with 22 rifles. A number have been killed by such bandits. Two shooters who were caught were given a term on the road gang but this has apparently not cured the trouble.

PREDATORY ANIMALS

During the biennial period trappers working in this bureau accounted for 5,797 coyotes, 1,917 wildcats and 3,411 lesser predators. In taking these 11,125 animals trappers covered 510,734 miles of traplines and made 487,279 sets, working 10,664 man days. In this work we cooperate with other agencies engaged in predatory animal control. Our men work in game areas that are not covered otherwise. Predators are not equally distributed in the various sections of the State. In some regions a record breaking catch can be made while in other areas much harder work will produce a poor take.

MOUNTAIN LIONS

Since mountain lion control was undertaken by the division there have been taken up to the end of the biennial period 8,523 lions. Without doubt this work has reflected, generally, on the deer population, deer being the primary food of lions. Certainly it has been a great help to sheepmen. It has been truthfully stated that every lion in sheep country will cause the loss of hundreds of dollars worth of sheep. In addition to the bounty of $20 on male and $30 on female lions, the division employs four lion hunters who spend all their time on this work. These men account for from one-fourth to one-third of the lions taken annually. During the biennium 527 lions were killed.

PITTMAN-ROBERTSON PROJECTS

Our Pittman-Robertson program was begun during the biennium. Money for the projects under the authority of the Federal act is secured from the tax on arms and ammunition. In order to be eligible a State must contribute 25 per cent of the amount received from the Government. Six projects are now under way. We realize that particular attention should be given to the quail situation. Accordingly, a study of all conditions affecting quail is being carried on in the lower central coast counties. Information gathered here will be of value in all parts of the State. An extensive study of the southern mule deer is being carried on in Santa Barbara County. This is a continuation of the work undertaken by the Forest Service which that agency was compelled to drop on account of insufficient funds. Study of the desert regions with the particular idea of improving game conditions is under way. The fur resources of our State are being thoroughly studied. The Pittman-Robertson program will enable us to carry on studies of the many problems that confront us in the management of our game. Disease, parasites, feed and water conditions, relationship of the various species one to another, in fact all the thousand and one questions that come up repeatedly and for which there have been no research funds, can now be undertaken.

Finally, I wish to express my appreciation for the assistance the bureau has received from commissioners, executive officers, and the other bureaus of the Division, to employees of the Department of Finance and other State agencies, and to a loyal and cooperative staff in the Bureau of Game Conservation.

REPORT OF THE BUREAU OF GAME FARMS

By August Bade, Chief

During the past two years the production and distribution of game birds from our two main farms has been increased over previous bienniums.

The main factor in this increased production and distribution is further development of the holding pen program. At the close of the previous biennium we were serving 987 pens. During the present biennium this number was increased to over 1400. Many more clubs have become interested and have constructed units of rearing pens in their particular locality.

In order to meet the increased demand of young birds that are raised in these sportsmen's pens our brooding units have been increased. The Fresno brooding unit has been increased a third and a new brooding unit has been installed at our Sacramento holding pens.

Soon after the first of the year of 1940 Federal aid in the form of labor by the National Youth Administration was offered. Bureau of Game Farms took advantage of this labor and have increased the facilities at Fresno, Sacramento and Willows. These units are all located in excellent game bird country and it is planned to keep these units as well as our Redding unit open the year around. These four units are spaced well in northern California and will give good results.

In southern California two other brooding and holding pen units are being constructed. One unit, of 12 double-colony houses and 48 rearing pens for Los Angeles County, is utilizing county labor, the other unit of the same size for San Diego County is utilizing Federal National Youth Administration labor. These two units will round out the valley quail program in southern California. Still another unit of 20 rearing pens at the 22d Agricultural District Fair Grounds at Del Mar has been built using Federal NYA labor.

The State Legislature passed a Game Management Area Law during the 1939 session. The law went into effect so late in 1939 that it could not be used. However, in 1940 the Game Management Law has created quite a lot of interest. This law allows farmers or landowners to manage their lands and agricultural practices so that they can raise game birds as a crop. With restrictions under the Game Management Law the farmer may then sell the privilege of harvesting part of the crop of game birds. Part of the crop must be left for the following spring nesting season. We hope that this program will help the farmer-sportsmen's situation.

This bureau realizes that our future upland game hunting and recreation depends largely upon the farmer. With this idea in mind we are giving assistance to the farmer and landowner in helping them raise game as a crop.

EGGS LAID

Ring-necked pheasant, Mongolian pheasant, Chinese pheasant, Reeves pheasant	217,950
Partridges	42,890
Quail	22,677

EGGS DISTRIBUTED

Ring-necked pheasant, Mongolian pheasant, Chinese pheasant, Reeves pheasant	28,634
Partridges	-----
Quail	136

BIRDS LIBERATED

Ring-necked pheasant, Mongolian pheasant, Chinese pheasant, Reeves pheasant	99,965
Partridges	18,091
Quail	14,916

August Bade, Chief
Bureau of Game Farms
Yountville, California

REPORT OF THE BUREAU OF PATROL AND LAW ENFORCEMENT

E. L. Macaulay, Chief of Patrol

Since the last biennial report an additional patrol district has been organized, the Marine Fisheries Patrol, under the immediate supervision of Inspector C. H. Groat. Inspector L. F. Chappell was assigned to the vacancy in the Central District caused by the death of Inspector S. H. Lyons on September 26, 1938. The Commission authorized an increase in the patrol force of 20 wardens and request has been made to the Personnel Board for a promotional examination to fill these positions.

A new twin-screw patrol boat, the "Perch" was placed in commission in November 1938. This vessel is of shallow draft design and will be used on the Sacramento River. The patrol boat "Albacore," an ocean-going vessel originally built in 1917, was sold, having outlived its usefulness, and the launch "Hunter" was disposed of for the same reason.

The motorvessel "Bluefin," while en route to Mexican waters, struck a reef off North Coronado Island at 2.30 a.m. November 12, 1939, during a dense fog. The captain was able to back off and proceed towards the mainland after sending a radio message for assistance. The vessel finally sank a quarter mile from Point Loma while being towed. The boat has been raised and repaired, and should give many more years of satisfactory service.

Conferences with all wardens present were held in Sacramento on February 10 and February 11, 1939, and in San Francisco April 18 and April 19, 1940. These meetings are very beneficial as they give every patrol employee an opportunity to become acquainted with Fish and Game problems in other portions of the State.

During the past biennium, the following members of this bureau retired from active service:

J. H. Gyger
T. K. Duncan

and the following passed away:

Inspector S. H. Lyons
Warden C. A. Holzhauser
Warden R. L. Sinkey
Warden J. H. Groves
Captain Wm. Lippincott

Junior Game Patrol activities have continued under the supervision of Warden M. F. Joy, Jr., but some difficulties have been encountered in securing qualified troop leaders who can spare the time necessary to properly take care of their groups.

A recapitulation of arrests and convictions will be found in the appendix on page 58.

REPORT OF THE BUREAU OF MARINE FISHERIES

By S. H. Dado, Assistant Chief
and
G. H. Clark, Supervising Fisheries Researcher

California continues to lead all other States in total production and value of its commercial fisheries. In 1938 there were 1,208,950,115 pounds and in 1939, 1,476,051,812 pounds of fish and shellfish delivered to California fishing ports by California fishing boats. The landings for the two years combined amounted to 2,685,001,927 pounds. Compared with the total catch for the two-year period of 1936 and 1937 of 2,417,557,000 pounds, the deliveries of 1938 and 1939 show an increase of over 11 per cent.

The canning of fish continues to increase with a pack of 6,341,557 cases in 1938 and 8,021,345 cases in 1939. This is a total pack of 14,362,902 cases for the two years, as compared with 13,790,431 cases for the combined years of 1936 and 1937. The estimated value of the canned, cured and manufactured fishery products for the years of 1938 and 1939 was $78,462,614. At the close of 1939 there was an investment of about $10,000,000 in fish canning and manufacturing plants, which gave employment to approximately 10,000 people at the peak of the packing season.

For the license year 1938-1939 (April 1st to March 31st), 7,519 market fishermen licenses were issued, and 8,697 in 1939-1940.

A complete report of the fish catch and fish pack for the calendar years of 1938 and 1939 and the special seasonal sardine reports for 1938-1939 and 1939-1940 were issued as Circulars No. 13 and No. 14, and are republished in the appendix of this report.

SARDINES

The sardine fishery continues to lead, in pounds landed, all other fisheries, not only in California but also in all other States. Its outstanding importance in tonnage, as compared with all other fish of the State, is shown in Figure 1.

With the passage of an initiative amendment adding Section 1110 to the Fish and Game Code, the floating reduction plants, which had been operating outside of the State's jurisdiction on the high seas off San Francisco for a number of years, ceased operations early in December, 1938. All sardines taken off the coast of California since that time have been delivered to shore plants.

The sardine catch delivered to California shore plants and to the floating reduction plants, which operated off the California coast during the 1938-39 season, is shown in tons for past two seasons.

Season	*Shore plant*	*Floating plant*	*Total*
1938-39	528,576	57,212 (Estimated)	585,788
1939-40	531,878	None	531,878

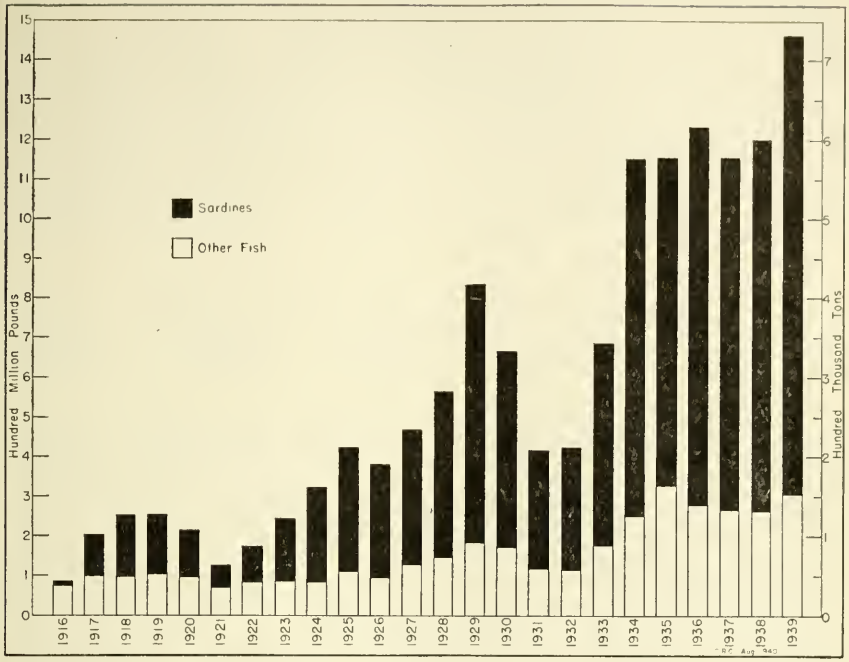

Sardines
Other Fish
Hundred Million Pounds
Hundred Thousand Tons
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939

FIG. 1

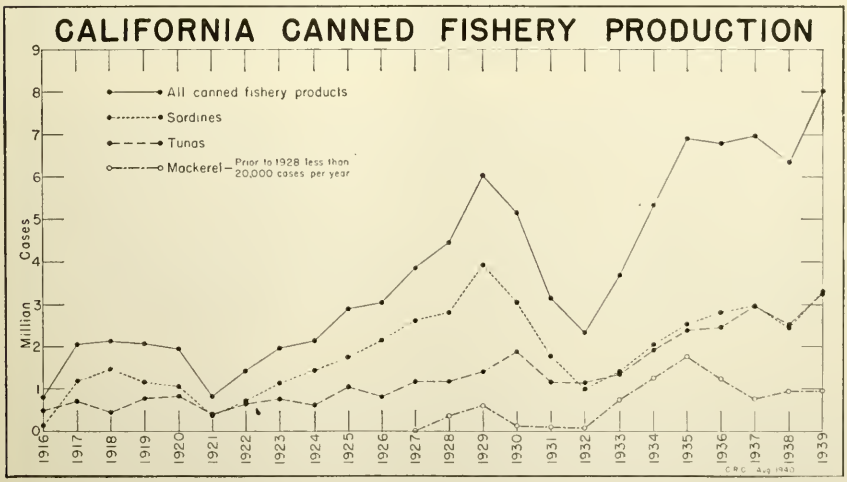

CALIFORNIA CANNED FISHERY PRODUCTION
All canned fishery products
Sardines
Tunas
Mackerel — Prior to 1928 less than 20,000 cases per year
Million Cases
0
1
2
3
4
5
6
7
8
9
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939

FIG. 2

The demand for canned sardines has increased, as the pack during the past two seasons, 1938-39 to 1939-40 (see table below), shows. Each of these two seasons closed with a shortage of canned sardines on hand. Practically all of the output of the sardine canneries was sold as soon as packed and if sardines of a size and quality fit for canning had been available in southern California during the 1939-40 season, the pack would no doubt have been much larger. It has been reported to us that many plants in southern California could not fill their orders for canned sardines. Some canned sardines were purchased in Monterey by southern California canners, and more would have been secured if they had been available.

Season	*Amount received for canning*	*Cases of 1-lb. oval cans*	*Cases other size cans equivalent to 1-lb. oval cans*	*Total*
1938-39	187,857 tons	1,490,739	1,083,037	2,573,776
1939-40	225,357 tons	1,834,174	1,300,794	3,134,968

Permits to use sardines for manufacture of meal and oil by a reduction process were issued during the past two seasons. The following table shows the amount of permit tonnage granted and the number of tons used under permit. Also recorded are the number of tons of meal and gallons of oil produced from fish received for use under permit, which includes meal and oil produced from cannery offal and overage from fish received for canning, as allowed under the law.

Season	*Permits issued*	*Used for reduction under permit*	*Meal produced*	*Oil produced*
1938-39	485,764 tons	337,849 tons	86,213 tons	15,502,057 gal.
1939-40	402,375 tons	303,426 tons	83,053 tons	17,389,992 gal.

In the season of 1939-40 the oil yield was five gallons per ton greater than in the previous season in the San Francisco area, and over three gallons per ton greater in the Monterey area. In southern California the oil yield per ton in 1939-40 was slightly lower than during the preceding season.

There is a continued tendency on the part of the fishermen to build additional purse seine boats for sardine fishing. For some time there have been more boats in the sardine fishery than needed, with the result that the fishermen, particularly in the San Francisco area and in the southern California area, did not do well individually, although the canners had profitable seasons. In the Monterey area the number of boats in the sardine fishery was limited during the past season. Consequently, each fisherman's profits were greater there than in the other ports.

TUNA

The amount of tuna delivered to plants in California is far below the sardine tonnage but the case pack of tuna is about equal to the sardine pack. In 1938, 2,527,498 cases of tuna were packed, and in 1939 it was 3,280,683 cases, an all-time high for the tuna industry. Since 1932 tuna has been packed only in the San Diego and San Pedro areas. During the past five years fair quantities of albacore (white meat tuna) have been landed at Monterey but none had been canned at this port until 1939 when one plant made a considerable pack. Pre-

viously all albacore landed in northern California had been shipped or trucked to the southern California plants for packing.

MACKEREL

Mackerel landings continue to hold third place in the fisheries of California, both in quantity of catch and pack of canned products.

In 1938, 79,848,015 pounds of mackerel were delivered and 958,890 cases packed; and in 1939, 80,908,851 pounds of mackerel were caught, resulting in a pack of 968,529 cases. Although these figures are larger than the totals for 1937, they are less than for the three high years of 1934, 1935 and 1936 when the pack each year exceeded one million cases. In 1938 and 1939, the canners and fishermen agreed to impose a closed season on mackerel fishing during April and May. Again in 1940 a closed season of April, May and June was agreed upon in order to give the mackerel some respite from overfishing. This closed period has been strictly adhered to by both parties, even though there were no penalties involved in case of infraction of the agreement. Their adherence to this closed season was very commendable and while it will no doubt benefit the mackerel fishery somewhat, we feel that it is not sufficient protection to the fishery in its present condition. Mackerel fishing for canning purposes was formerly done by boats using round haul nets. However, scarcity of mackerel has brought about a major change in the fishery. During the fall of 1939 very few mackerel were taken with round haul nets because the fish were so scattered and in such small schools that it was unprofitable for round haul net boats to engage exclusively in mackerel fishing. Large numbers of small boats, using chum bait and dip nets, have been doing most of the fishing and have made consistent but not large catches. With this great number of small craft engaged in the fishery and putting forth additional effort, the total catch has remained high as far as poundage is concerned. It is very apparent that the mackerel is being heavily overfished and is in need of additional protection.

CRAB

In the past two years, many changes have occurred in the State's commercial crab fishery. Price disputes, due to the influx of large, graded crabs at a lower price shipped from Oregon, Washington, and Eureka, have caused considerable economic trouble to the local San Francisco crab industry. For a great many years, the San Francisco Crab Union, a cooperative association of 250 to 300 members, has had a noncompetitive market on crabs in California. By taking advantage of the provisions (Section 460) of the California Fish and Game Code, fishermen in Eureka during the last two years were able to ship crabs from Humboldt, Del Norte and Mendocino Counties to other districts, upon presentation of an affidavit showing the crabs had been taken outside of the three-mile limit. These activities added an impetus to the crab industry in these northern counties—the catch increasing from 150,000 pounds in 1937 to 530,000 pounds in 1938, and to 2,200,000 pounds in 1939. This increased catch will not affect the crab population as long as the laws are observed. Male crabs, seven inches across the back (which is the minimum legal size) have passed through one or more spawning seasons, and as female crabs are fully protected at

all times, the present larger catch is a harvest of the surplus male crabs which have reached maturity.

SHARKS

Sharks have always been considered a nuisance by both the sport and commercial fishermen. These fish tear their nets, eat their bait, and are believed to be predators of the important food fishes. Previous to 1937, an average of only 500,000 pounds a year of sharks had been utilized in fresh fish markets, and most of the sharks taken in nets and on lines had been knocked on the head and cast back into the sea. During 1937, it was found that the liver oil of certain species of sharks, notably soupfin, was high in the number of vitamin A units. Several companies in California became interested in obtaining the sharks for the liver oils, for use in fortifying the vitamin content of other fish oils, such as that of sardines, utilized in poultry and animal feeding. The demand for shark liver oil caused fishermen to turn from other fishing activities to shark fishing. The catch, which was 914,000 pounds in 1937, increased to 7,504,000 pounds in 1938, and to 9,157,000 pounds in 1939. Prices started at $40 per ton to the fishermen in 1938 and increased until $70 per ton is now paid for soupfin, the most desirable species. It is reported that the price may be $80 or more per ton before the 1940 season closes.

Because the majority of the shark catch is now used in an extraction or reduction process, it became necessary for the Division of Fish and Game to issue reduction permits to companies wishing to process sharks for their liver oils. Shark carcasses, after the liver has been removed, are used to some extent for fresh food, but 90 per cent are made into meal.

Some of the shark fishermen and reduction operators, as well as the Division, are doubtful if the shark supply can withstand such heavy exploitation. Some protection may be desirable after further investigation.

Report of the California State Fisheries Laboratory

By W. L. Scofield, Supervisor

The goal sought in the management of the marine fisheries of the State is full utilization consistent with sustained yield. This implies maintaining a full breeding stock from which is harvested an annual crop approximately equivalent to the replacements spawned from year to year. The research program of the laboratory is designed to furnish to the administrative officers the necessary information as to the state of the supply, degree of utilization, effectiveness of present laws, and the life histories and behavior of the various species, so that more efficient regulations may be enacted if they are needed.

A moderately comprehensive knowledge of changes in abundance, degree of utilization and life history of any one species requires, in most cases, several years of study followed by continuous observation so long as the fishery is in need of management. Without unlimited personnel and funds, such detailed studies must be confined to the most important species only and the lesser marine resources must be observed

more superficially. The major research program, therefore, is concerned with the four most important species. Less intensive studies are conducted covering a larger number of our fisheries. Two activities, other than biological research, are of major importance and each of these as well as each of the four studies mentioned above has for some years been operating under the direction of a staff member, who has been assigned the responsibility for carrying out the program as planned. These assignments are: sardines, mackerel, tuna, flatfish, compilation of statistics, and marine sport catch. Other important activities are a survey of the Central Valley Water Project, a survey of the abalone fishery, and the oyster culture studies.

RESEARCH VESSEL

We have long felt the need of a research vessel especially designed for all kinds of fishing and the operation of all types of collecting gear. The launching on December 17, 1938, of such a vessel was a highlight of the past biennium. The new vessel, named the "*N. B. Scofield*" after the "father of the Bureau of Marine Fisheries," is 100 feet, 6 inches in length, carries a seven-man crew with bunk space for a research staff, and is constructed so as to accommodate such widely divergent activities as otter board trawling and tuna live-bait fishing. In addition to laboratory space both forward and aft, the hold is provided with the latest in refrigeration equipment so that spoilage problems in chilling and storage may be studied. Throughout, the vessel carries the best in equipment and our hopes for her accomplishment are now being justified by the work she has been doing both locally and on distant fishing banks. Her 1940 schedule included a ten-weeks' tuna fishing trip to off-shore banks as far south as the Galapagos Islands on the equator.

SARDINE

The sardine fishery, our leading fisheries industry, has received major attention since the laboratory was established. Most of the preliminary work has been accomplished so that the problem now is to measure population changes, especially the contributions made by each year-class entering the fishery and the effect of each annual catch upon the diminished supply.

Tagging begun four years ago has continued with the cooperation of the Dominion of Canada and the States of Oregon and Washington. Tag returns have confirmed our conclusions about migrations but, of much greater significance, the percentage of returns offers another method of measuring fishing intensity and population decline.

One portion of the research program featured during the last two years is an effort to estimate the strength of the next entering age-class by direct observation of the schools of small sardines. Each fall a survey is conducted to estimate the survivors from the previous spring spawning. This is supplemented by a general bait survey along the coast of southern California, the region of heaviest spawning of the sardine.

Our sardine research program necessarily has been modified somewhat in order to cooperate with the sardine investigations launched in 1938 by the Federal Fish and Wildlife Service, formerly the United States Bureau of Fisheries.

MACKEREL

Over-utilization of mackerel has become much more apparent during the biennium and the evidences of declining abundance have been reported and publicized. Scarcity is admitted by most fishermen and canners so that in 1938 they voluntarily imposed upon themselves a closed season and scrupulously observed it for three years.

The average catch of a purse seine boat dropped steadily from 1934 to 1938, till the catches of 1938 were only one-quarter of what they were four years before. As a result, most of these boats dropped out of the fishery in 1939, their places being taken by small boats fishing with strikers and dip nets. This type of fishing is cheaper and more successful in small scattered schools, and our excessive total catch has been maintained by the larger number of small boats. In 1939 about 400 such boats fished mackerel in southern California.

Much of the needed biological information has been reported so that more of the research work during the last two years has been directed toward determining at what level this over-worked fishery should be held. Features of the work are: (1) Tagging to show migrations and to help in making estimations of population. More than 27,000 mackerel have been tagged from Monterey, California, to Turtle Bay, Lower California, and over 1,000 tags have been recovered. (2) Analysis of boat catches as a measure of abundance. (3) Yield from each fishing area. (4) Age composition and mortality rate of population. (5) Spawning extent and volume in the different areas. Larvae have been discovered in the Gulf of California in February and eggs found along the west coast of Lower California in January and February, whereas the local spawning season is chiefly during May, June and July.

TUNA

At least five species of tuna are caught by California boats along our coast and south to the equator. The solution of several biological and management problems will be influenced greatly by the answer to the question of whether we are drawing upon a single freely migrating population or upon several separated groups or local races. The chief object of the tuna program is therefore to gather biological data for obtaining the answer to this question. This includes studies of the characteristics of the fish from different fishing areas and tagging to determine migrations. Life-history data are being gathered and material accumulated for determining the species and races of the tunas in our fishery.

During the past biennium, the chief accomplishment has been valuable contributions to the knowledge of fish spoilage, changes taking place during storage by different methods on refrigerated fishing boats, and recommendations as to how losses due to spoilage on boats may be reduced. Preliminary results, as rapidly as available, have been reported in mimeographed form for distribution to men of the fish trades and others interested in fish refrigeration.

BOTTOM FISH

Work on the bottom fish of northern California has been somewhat restricted because the press of other investigations necessitated the use of the research vessels in other waters. However, the collections

of detailed fishing and catch data have been continued and analyzed regularly. The fishery has maintained a satisfactory increase in catch per unit of gear since the time of the voluntary adoption of larger mesh sizes in the drag nets used in this industry. There has been an actual gain of over 2,000,000 pounds of fish for the period, 1934-1939, inclusive, for the same amount of fishing effort, because of the adjustment in the mesh size. This larger catch resulted in a monetary value of over $100,000. In addition, untold thousands of young fish have been saved and thus allowed to reach spawning as well as market size. In the past two years, several boats operating otter trawls have entered the fishery for ocean bottom species, in competition with the traditional two-boat paranzella net "rigs," which have dominated this California industry since its inception in the 1800's.

On the investigative trips on the Division's fisheries research vessels, collections have been made of material for analyzing the abundance of the various age-classes of the flatfish, their mortality rates (due to natural causes and fishing exploitation); and in addition, tagging operations have been conducted to determine the extent of migrations of the various species. Two such trips were made in the course of the biennium on flatfish research work—one in the fall of 1938 along the California coast from San Francisco to Crescent City, and the other in the spring of 1939 in the vicinity of San Francisco and Monterey. An extended cruise is planned for the early fall of 1940, at which time we hope to do a considerable amount of fish tagging and collecting other additional material.

Because of the developments in the use of the otter trawl gear by independent boats (not operated by companies as in the case of the paranzella boats, which had voluntarily adopted the use of a larger mesh size in their nets for the protection of the immature fish), it is desirable that legislative recommendations be proposed to provide for a minimum mesh size in the sacks of all drag nets used or in possession in the State.

CENTRAL VALLEY WATER PROJECT STUDY

Early in 1939, funds were made available to conduct investigations of the effect of the Central Valley Water Project in the Sacramento and San Joaquin valleys, on the fish life in that region. The water plan of this Project, now under construction by the United States Reclamation Service, is far reaching. The resulting changes have a direct bearing on the fishes in these waters, because of the construction of the Shasta Dam, Friant Dam and the Delta Cross Channel, which will supply additional irrigation water to the San Joaquin River, the Madera Canal and the San Joaquin-Kern Canal. Investigations by the California Division of Fish and Game have been in progress since 1939 to determine the effects of these water changes on the population of salmon, striped bass, shad and other species of fish inhabiting the Delta area and the San Joaquin River. (The Sacramento River north of the Delta area is being investigated by United States Government agencies, with the California Division of Fish and Game acting in an advisory capacity.) Final engineering plans for the water changes in the Delta and San Joaquin River are not yet available. However, the knowledge gained through our investigations has now reached a stage wherein

definite information can be applied to the formative engineering plans of the Project, to insure the protection of the fish life with a minimum additional expenditure to the United States Reclamation Service. Our studies will continue for at least another year in order to complete all phases of this investigation now under way. Even after the various water projects of the Central Valley are constructed, the biological work will be continued in order to ascertain the effectiveness of the fish protective methods adopted.

In addition to the salmon research being done in connection with the Central Valley investigations, tagging of salmon in the ocean has been undertaken. The returns from this marking will make it possible to trace the movements of salmon in the sea and to determine to which stream the fish return from the ocean.

A statistical analysis of the California salmon fishery for the years 1916 to 1939 was also made to determine the relative abundance of the salmon populations. The results will be beneficial in managing this resource in an effort to rehabilitate the once important salmon fishery of the State.

ABALONE

During the period 1938-1940, investigative work was undertaken and partially completed on the abalone fishery of the State. The abalone areas from Point Conception to Monterey were surveyed by means of diving to evaluate the condition of the population of red abalones, especially the relative abundance of various sizes. Very young abalones (one mm. in diameter) were taken in Carmel Bay, whereas a scarcity of very young and also of legal sized abalones was found in most of District 18. Studies will be conducted to determine the spawning habits, the possible drift of eggs and larvae, and the rate of growth, so that better management of this fishery may be effected. To obtain the highest yield possible from this fishery, its utilization should be managed by "farming" certain localities; that is, permitting commercial diving in one region for a time and transferring activities to another area after the surplus abalones of the legal size of eight inches and over have been harvested. Knowing the growth rate and the movement (if such occurs) of eggs and larvae, each designated area can be "farmed" or fished on a high productive basis without endangering the basic spawning reserve.

Results of the diving survey have strengthened the belief that there should be no conflict between the noncommercial abalone fishermen and commercial fishermen, as investigations continue to confirm the fact that abalones do not move from deep to shallow water but are stationary during their life after the shell is formed.

OYSTER

Oyster culture activities in California during the past two years have shown a very marked progress. The Bureau of Marine Fisheries is aiding the industry in developing the native (or Olympia) oyster grounds in Humboldt Bay, and these oysters are now beginning to be of marketable size.

Two large companies are actively engaged in the cultivation of native oysters in Humboldt Bay, and in addition there are several smaller operators. In 1938, the oyster spat catch was normal, and

in 1939 it was very satisfactory. Although the results for the present year (1940) are still incomplete, indications point to a good setting of spat. Successful spat setting in this region is almost completely due to the research work conducted, and the constant observation of spawning oysters and temperature and salinity of the water. Through these studies, the industry is given ample opportunity to place the spat collectors in the water at the proper time.

In addition to the work on native oysters in Humboldt Bay, the Bureau of Marine Fisheries is assisting the oyster industry in the cultivation of Japanese oysters at Drake's Estuary, Tomales Bay, Bodega Bay and Morro Bay. Most of the Japanese oysters are raised from seed imported from Japan. Seed planting in California has been increased to supply a steadily expanding market for this species —in 1938 a total of 1,200,000 pounds and in 1939, 1,500,000 pounds were marketed. One of the present activities in the investigation of the Japanese oyster cultivation is an attempt to set up conditions so that this species will spawn and the spat set on collectors in our own waters, to eliminate future necessity of importing seed for growing these oysters. Although the Japanese oysters have successfully spawned under controlled conditions in our waters, to date no actual setting of spat has occurred.

MARINE SPORT CATCH

During the past biennium, improvement has been made in the quality and completeness of our marine sport catch records. This is due to a better understanding by the sport fishermen and boat operators of the need for this work. Careful supervision and educational work have produced this result. Sufficient records have now been gathered for the beginning of analysis and a report is in preparation. Preliminary figures have been gathered for the salmon, shad and striped bass sport catch in the bay and river areas. However, there remains much needed improvement in our sport catch records if they are to serve their purpose of giving us a basis for an adequate knowledge of changes in abundance and a gauge of fishing intensity.

The catch by marine anglers is often looked upon as quite secondary to the catch made by commercial fishermen, but for some species the sport catch exceeds the commercial because of the large number of anglers who take advantage of recreational facilities offered by ocean angling. The number of party and charter boats has been increasing and the number of fishermen patronizing anchored barges and piers has not declined. For example, in 1938 the ocean catch made by party boats and barges only, exclusive of other types of angling in the ocean, bays and rivers, was 5,344,000 pounds. The leading species are barracuda with an average annual sport catch of 2,340,000 pounds and yellowtail averaging about 900,000 pounds annually.

STATISTICS

The Laboratory has been the repository for most of the statistics gathered by the Bureau of Marine Fisheries, including detailed catches of commercial fishing boats, boat registrations, licenses sold, and marine angling records. Since 1931 these records have been compiled by the punched card method with electrically operated

sorting and tabulating machines. The reporting of this material has been systematized into routine summaries during the last eight years, so that for the past four or five years there has been opportunity to develop a series of special reports to be used in studies by the research staff and by administrative officers. Special reports include a wide range of subjects, such as the recoveries of tagged fish, records of fish used for bait, fishing operations reported by patrol boats, tuna catches segregated by gear, salmon catches, an analysis of fluctuating prices for fish as paid to fishermen, and detailed reports for the four-year period, 1936-1939, covering the marine sport catch data.

With our trained statistical staff and mechanical set-up available, we have been charged with servicing the records of other bureaus of the Division of Fish and Game. A feature of the past biennium has been the developing of reports in a form to fulfill the needs of workers in other bureaus. For example, the catch of anglers as reported on license applications was tabulated for the Bureau of Fish Conservation and was checked against the returns from a questionnaire sent out to 35,000 fishermen representative of the 300,000 licensed anglers of the State. Likewise, the game kill was tabulated for the Bureau of Game Conservation from license applications, and a comparison made with the returns from a questionnaire sent to 30,000 hunters in the State. Special tabulations were made for use in an analysis of the game kill, which report is now being prepared by the Bureau of Game Conservation. The deer kill, as in the past, has been reported in different forms to show yield of deer by areas and kill by classes of hunters as determined by the place of residence. More recently, the Bureau of Licenses has been assisted by a special sample questionnaire sent to prospective purchasers of licenses.

PUBLICATIONS

Since work worth doing is worth reporting, practically all studies conducted at the Laboratory are recorded as progress or final reports in most cases for publication but in a few instances for mimeographing or as typewritten reports to the administrative officers. More formal reports are issued as "Fish Bulletins." Special articles are published in the quarterly magazine, "California Fish and Game"; in the monthly magazine, "California Conservationist"; and in trade journals and biological bulletins.

Five "Fish Bulletins" have been prepared during the biennium, as follows:

No. 52. Historical account of the Los Angeles mackerel fishery. By Richard S. Croker. 62 pp. 1938.

No. 53. Measures of abundance of the sardine, *Sardinops caerulea*, in California waters. By Frances N. Clark. 45 pp. 1939.

No. 54. The fishes of the family Sciaenidae (croakers) of California. By Tage Skogsberg. 62 pp. 1939.

No. 55. Report on returns of drift bottles released off southern California, 1937. By Richard B. Tibby. 36 pp. 1939.

No. 56. Development of the eggs and early larvae of six California fishes. By Paul L. Budd. 50 pp., 1940.

Laboratory staff members have contributed articles and notes for publication in "California Fish and Game" and in other periodicals.

The titles are listed as they illustrate the diversity of Laboratory activities.

CALIFORNIA FISH AND GAME:

APLIN, J. A.

Appearance of black brant at San Quentin Bay, Lower California. Vol. 26, p. 76, 1940.
The occurrence of sauries in southern California. Vol. 25, pp. 343-344, 1939.

BONNOT, PAUL; CLARK, G. H.; and HATTON, S. ROSS

California sea lion census for 1938. Vol. 24, pp. 415-419, 1938.

BYERS, ROBERT D.

The California shark fishery. Vol. 26, pp. 23-38, 1940.
Monterey purse seiners extend fishing area. Vol. 25, pp. 184-185, 1939.
Seattle halibut boats catch Monterey sharks. Vol. 25, p. 184, 1939.

CLARK, FRANCES N.

The application of sardine life-history to the industry. Vol. 26, pp. 39-48, 1940.
Can the supply of sardines be maintained in California waters? Vol. 25, pp. 172-176, 1939.
A true smelt found near Los Angeles Harbor. Vol. 26, p. 180, 1940.

CLARK, G. H.

California salmon catch records. Vol. 26, pp. 49-66, 1940.
The 1938 salmon catch. Vol. 25, pp. 43-45, 1939.

CLOTHIER, CHARLES R.

The trigger mechanism of a trigger fish *(Capriscus polylepis)*. Vol. 25, pp. 233-236, 1939.

CROKER, RICHARD S.

The louvar in California waters. Vol. 25, pp. 253-254, 1939.
One hundred issues of "California fish and game." Vol. 25, pp. 206-213, 1939.

FRY, DONALD H., JR.

Brant census of San Quentin Bay, Lower California. Vol. 24, pp. 347-349, 1938.
Giant leatherback turtle taken near San Pedro, California. Vol. 25, p. 48, 1939.
A northern record for a Central American pompano. Vol. 26, p. 77, 1940.
A winter influx of sea lions from Lower California. Vol. 25, pp. 245-250, 1939.

FRY, DONALD H., JR., and ROEDEL, PHIL M.

Progress report on tagging Pacific mackerel. Vol. 25, pp. 2-17, 1939.

GODSIL, H. C.

The "N. B. Scofield": a progress report. Vol. 26, pp. 67-69, 1940.

HATTON, S. ROSS, and SMALLEY, GEORGE R.

Reduction processes for sardines in California. Vol. 24, pp. 391-414, 1938.

JANSSEN, JOHN F., JR.

1938 recoveries of California sardine tags in northern waters. Vol. 25, pp. 47-48, 1939.
Second report of sardine tagging in California. Vol. 24, pp. 376-390, 1938.

PHILLIPS, J. B.

Arrival of black sea brant in Lower California in 1938. Vol. 25, p. 50, 1939.
The market crab of California and its close relatives. Vol. 25, pp. 18-29, 1939.
The rockfish of the Monterey wholesale fish markets. Vol. 25, pp. 214-225, 1939.
A spiny lobster *(Panulirus interruptus)* recovered in Monterey Bay. Vol. 26, pp. 179-180, 1940.

ROEDEL, PHIL M.

Another record of the Monterey Spanish mackerel. Vol. 25, p. 343, 1939.
Notes on the ribbon-fish, *Trachypterus rex-salmonorum*. Vol. 24, pp. 422-423, 1938.
The Pismo clam in 1938. Vol. 25, pp. 177-181, 1939.
Record-size mackerel in Santa Monica Bay. Vol. 24, p. 423, 1938.
Results of the 1939 Pismo clam census. Vol. 26, pp. 178-179, 1940.

ROEDEL, PHIL M., and MCCULLY, HOWARD

Occurrence of the wolf-fish, *Alepisaurus aesculapius* (Bean) in southern California. Vol. 25, pp. 35-37, 1939.

SCOFIELD, W. L.

The Bureau of Marine Fisheries was founded twenty-five years ago. Vol. 25, pp. 251-252, 1939.
Catfish in Bixby Slough. Vol. 25, pp. 49-50, 1939.
Cattle and fish. Vol. 25, pp. 182-184, 1939.
Is the purse seine an engine of destruction? Vol. 25, pp. 325-329, 1939.
More recoveries from the first thousand sardines tagged. Vol. 25, pp. 252-253, 1939.
Striped bass at Oceanside, southern California. Vol. 25, p. 50, 1939.
Tall tales of the sea. Vol. 26, pp. 70-74, 1940.

AMERICAN FISHERIES SOCIETY. TRANSACTIONS:

BONNOT, PAUL

Methods of collecting oyster spat. Vol. 69, pp. 263-267, 1940.

CLARK, G. H., and HATTON, S. R.

Savings gear in the California drag-net fishery. Vol. 69, pp. 106-110, 1940.

CROKER, R. S.

Three years of fisheries statistics on marine sport fishing in California. Vol. 69, pp. 111-118, 1940.

CONSEIL PERMANENT INTERNATIONAL POUR L'EXPLORATION DE LA MER. JOURNAL DU CONSEIL:

GODSIL, H. C.

Tuna tags. Vol. 13, no. 2, pp. 217-220, 1938.

JANSSEN, JOHN F., JR.

Two years of sardine tagging in California. Vol. 14, no. 1, pp. 48-66, 1939.

CALIFORNIA CONSERVATIONIST:

The staff has contributed articles and notes to this monthly magazine issued by the State Department of Natural Resources. In addition, excerpts from "California Fish and Game" and "Fish Bulletins" have been published in this periodical.

LIBRARY

The collections in the laboratory library are steadily growing through the purchase of new acquisitions but mainly through the exchange of the California Division of Fish and Game publications for those of various institutions and individuals in the United States and foreign countries. These exchange relations have resulted in valuable files of books and publications on marine biology, particularly fisheries and related subjects. To all those who have made contributions we wish to express our appreciation.

Including the literature acquired during the biennium, the library now contains 32,100 pamphlets and 2,400 bound volumes. A

very large number of subject and author entries was added to the card catalog.

The material is carefully selected to be of the greatest possible usefulness to the fisheries research staff and to the other members of the Division of Fish and Game. However, the literature is not only consulted by our own staffs but by a considerable number of men in the fisheries trade and allied industries, in addition to research men from various parts of the United States and from Europe, British Colonial possessions, South and Central America, the Orient and other foreign countries. Instructors and students in universities, colleges, and secondary and elementary schools interested in our marine resources, also avail themselves of the facilities of the library.

PUBLIC TALKS

When called upon, members of the research staff give talks on marine fisheries before service organizations, schools, scientific societies and nature clubs. During the past biennium 74 such talks were given, including six radio broadcasts.

ASSISTANCE FROM BUREAU OF PATROL AND LAW ENFORCEMENT

The operation of our statistical system and much of our field work in gathering data of the fisheries have depended upon the generous assistance given us by the Bureau of Patrol and Law Enforcement. We are especially indebted to the men of the Marine Patrol Detail who have cheerfully aided us in every way possible.

REPORT OF THE BUREAU OF ENGINEERING

By J. Spencer, Chief

The Bureau of Engineering was formerly known as the Bureau of Hydraulics. The change in name was made as the new title was considered to be more informative to the general public and also the work as now set up is more inclusive than that as designated by the word "Hydraulic."

The general engineering work carried on for the other bureaus of the commission consists of surveys, engineering studies, mapping, and other work as desired along general engineering lines. In the early part of the biennium a considerable amount of work was done for the Fish Conservation Bureau consisting of surveys for alterations at hatcheries, new work, such as the proposed Lytle Creek Hatchery (though later abandoned) a hatchery in Mono County, and other places. Where it is expected that construction of any importance will be carried on the basic plans and ideas of the commission personnel are set out in general for final preparation by the Board of Public Works, Division of Architecture. Extensive studies were carried on as to the water uses by a hatchery, the matter was before a Supreme Court and the decision in the main upheld the viewpoint of the commission.

A number of surveys were made for other bureaus but not to the extent as above noted though present indications are that engineering work will be materially added to during the coming biennium.

The activities of the bureau as related to stream improvements were not neglected and major work was done by 14 owners of dams by constructing new fishways, replacing ones taken out by storms, or improving the ones in place. These fishways are located in 12 different counties in the State. Every effort is made to effect installations or improvements of fishways without recourse to law, but it was necessary to cite one owner to the court, and by agreement the owner plead guilty, was fined $250, all of which was suspended contingent upon the proper fishway installation within a specified time.

It is of interest to note that investigations carried on in connection with proposed developments show that the fishways previously installed pass upward moving fish satisfactorily.

The work of replacing inefficient fish screens as authorized under a broad policy of this commission has continued, the work in general having been confined to Siskiyou, Tehama, and Lassen counties. The installations made are of concrete and steel and substantial. The effort has been made to work in localities where there were many diversions from the natural water courses, thus avoiding as much travel as possible, and tending toward economic construction. It should be remembered that Siskiyou County has considerable numbers of sea-run fish and it was thought that more good would result

in a short space of time by protecting these sea-run fish. A few screens have been placed by other agencies, such as the United States Bureau of Reclamation, United States Indian Service, and several by cities and utilities. There have been installed during this period 160 fish screens and they have functioned, in general, satisfactorily.

The present fish screen law now in effect, aside from its equal division of costs of installation, operation and maintenance of fish screens between the ditch owner and the commission includes many and complicated features so that it may be said without reservation that the law is unworkable. The exception to the division of costs in the fish screen law is that where water is used for the generation of electric energy, then the owner pays the entire cost of installation.

Several years ago the commission issued its order requiring the Pacific Gas & Electric Co. to install a fish screen at its Fuller Lake outlet in Nevada County. The company did not comply and a court action resulted. The Sacramento County superior court upheld the viewpoint of the company but on appeal to the appellate court, and later sustained by the California Supreme Court, it was held that the commission had the authority to require ditch owners, where water is used for generation of electric energy, to install a fish screen at the owner's expense. Subsequently the company requested that they be allowed 50 per cent of the operating costs, claiming the code so stated and their viewpoint was confirmed by an opinion from the Attorney General of the State so that now it is incumbent under the present law for this commission, using sportsmen's money, to pay for one-half of the operation and maintenance costs of the fish screens to such concerns as use water for generation of electrical energy where such screens were installed under the provisions of the law.

There has been considerable discussion in the past regarding fish screens and it is evident from the interest shown by sportsmen and other agencies that this subject is considered of importance, the belief being that without fish screens in the water diversions of the State, where needed, that much of the natural as well as the artificially propagated fish are lost. This is indicated by the fact that the American Legion, Department of California, leading sportsmen's clubs, and other agencies, have endorsed a new fish screen bill which proposes in brief that the commission will, at its own expense, install fish screens on water diversions where the water is used initially, primarily, and in the major portion thereof for agricultural purposes; and all other ditch owners, where water is used for other purposes, shall install fish screens at their own expense. All screens, regardless of how or when installed, shall be operated and maintained by the ditch owner. The proposed bill is much simpler than the existing fish screen law and it is believed that it will be workable and its application would tend to better relations between the ditch owners, water users, and this commission. This bill will be introduced at the 1941 legislative session and it is hoped that those who are interested in the protection of fish life in this State will assist and do what they can to see that it is enacted and becomes the law.

In the biennium over 1,500 surveys, inspections, and investigations of various kinds were made and several hundred maps, sketches, and plans were prepared.

Conservation of fish and game in the majority of instances is in conflict with the encroaching civilization and without doubt the greatest problem that has been presented to the commission, with respect to fish life, is that presented by the development of the Central Valleys Project within this State. The commission in its contacts with the Bureau of Reclamation is acting through a committee and another bureau will probably report in detail as to this project.

The bureau has been in contact with the sportsmen's clubs throughout the State and the writer is most appreciative of the cooperation and the material assistance received, and hopes that these agreeable and helpful relations will continue.

REPORT OF THE BUREAU OF LICENSES

By H. R. Dunbar, Chief

The biennium of July 1, 1938, to June 30, 1940, has been one of the most successful in the management of license distribution and sales. A survey of the State has been made to determine localities that needed additional agencies and the means of better serving certain sections of the State.

This survey revealed that in the San Joaquin Valley a shortage of licenses had occurred each year during the opening of trout, dove and deer seasons. Considering the large population of the San Joaquin Valley it was decided to open a branch office at Fresno to serve the entire valley. This office was opened in August of 1938, and since then no shortage of licenses has occurred in the area being served.

In past years it has been difficult to maintain an adequate supply of licenses in Siskiyou, Shasta, Modoc and Lassen counties during the opening of deer season. This shortage was usually caused by the large number of outside hunters delaying the purchase of their hunting licenses and tags until they reached the hunting grounds. This problem has in the past two years been largely overcome by the establishment of additional agencies in the principal towns of those counties.

Offices are now maintained at the following places for license distribution: Sacramento, San Francisco, Fresno, Los Angeles, Terminal Island and San Diego.

For the purpose of managing the distribution and sale of licenses the State has been divided into two districts: the northern district with a supervisor of distribution in charge of all credit distribution, also of the Sacramento, San Francisco and Fresno offices; and, the southern district, with a supervisor in charge of southern California which includes the Los Angeles, Terminal Island and San Diego offices. These two supervisors spend a good part of their time in the field establishing agencies and promoting good will among the agents and sportsmen.

At present there is in excess of 3,500 agencies maintained throughout the State and the relationship between this bureau and our agencies is most friendly. The sale of licenses has increased each year and with the cooperation of these agencies we are now able to have licenses on sale whenever and wherever a sportsman may apply.

THIRTEEN-YEAR RECORD OF DEER KILL

County	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total	Total
Alameda	220	263	275	252	248	164	148	204	268	266	398	491	623
Alpine	67	66	89	124	129	191	137	102	144	153	275	343	317
Amador	59	78	87	101	104	69	66	76	100	108	183	200	255
Butte	228	212	234	314	494	287	205	235	221	206	335	393	455
Calaveras	149	191	175	283	227	148	114	148	119	149	235	250	398
Colusa	263	272	297	343	304	198	220	168	177	211	346	330	370
Contra Costa	5	6	14	6	11	8	9	19	27	32	30	40	61
Del Norte	42	48	55	40	38	13	17	32	39	23	23	18	20
El Dorado	535	548	597	685	699	462	368	417	478	428	678	726	982
Fresno	592	763	764	893	952	882	888	1,359	1,259	1,522	1,658	1,735	2,470
Glenn	623	592	586	601	430	348	253	260	353	548	829	764	725
Humboldt	821	777	689	917	1,069	807	842	877	921	796	940	1,284	932
Imperial	1	4	4	1	-------	4	5	-------	1	1	3	3	-------
Inyo	173	239	253	251	211	180	297	285	301	386	316	323	660
Kern	218	295	297	324	354	196	266	251	203	249	278	297	403
Kings	3	3	3	12	10	13	5	6	8	9	7	8	20
Lake	901	1,038	841	885	726	524	481	419	570	757	1,418	1,803	2,103
Lassen	296	393	511	585	607	508	551	632	781	1,037	986	952	1,362
Los Angeles	435	369	691	637	949	819	572	750	800	772	1,192	1,161	659
Madera	260	300	313	379	442	316	268	310	360	314	421	537	773
Marin	367	444	394	403	449	376	301	341	328	411	482	534	649
Mariposa	95	134	144	235	190	134	100	160	121	139	181	201	538
Mendocino	1,475	1,468	1,355	1,483	1,706	1,273	1,234	1,185	1,207	1,372	2,072	2,700	2,967
Merced	67	68	48	68	60	45	45	60	26	53	67	82	90
Modoc	510	729	835	1,129	1,486	916	955	1,553	1,871	2,296	1,710	1,832	2,285
Mono	36	55	76	73	110	94	125	103	134	216	205	237	463
Monterey	757	830	734	864	900	484	631	736	702	759	821	992	1,317
Napa	442	569	523	536	488	304	285	288	278	415	544	795	927
Nevada	125	140	169	236	229	144	154	182	202	230	465	465	611
Orange	56	69	81	90	114	87	36	55	40	54	99	99	123
Placer	341	346	335	340	361	271	196	175	194	205	319	398	455
Plumas	551	586	695	764	968	829	917	1,128	1,144	1,270	1,718	1,609	1,985
Riverside	323	249	404	629	663	488	354	307	351	290	356	309	515
Sacramento	-------	2	-------	2	4	2	2	1	1	3	5	5	5
San Benito	217	320	269	313	275	152	172	214	160	285	408	458	650
San Bernardino	74	122	120	188	237	187	153	180	196	176	225	212	534
San Diego	169	232	233	250	334	263	173	259	237	263	363	390	558
San Francisco	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------
San Joaquin	21	14	22	22	24	15	14	17	11	14	21	33	48
San Luis Obispo	394	450	455	568	552	377	436	497	630	718	778	1,000	988
San Mateo	77	89	102	100	103	85	105	133	99	106	153	135	148
Santa Barbara	669	851	717	777	755	532	547	608	748	807	957	946	931
Santa Clara	397	536	577	650	697	415	393	421	463	595	754	744	1,017
Santa Cruz	78	92	102	115	127	85	108	108	81	92	118	163	164
Shasta	612	603	702	655	773	527	517	630	653	689	1,065	990	1,169
Sierra	101	102	132	137	190	151	158	179	210	302	531	494	656
Siskiyou	1,665	1,654	1,211	1,372	1,516	896	823	1,043	1,092	1,227	1,186	1,096	1,559
Solano	45	52	54	58	45	31	19	20	23	32	39	63	87
Sonoma	751	753	732	865	903	709	748	704	554	536	744	948	1,094
Stanislaus	91	115	119	111	94	37	37	39	39	77	107	103	151
Sutter	1	3	2	1	1	-------	-------	-------	-------	-------	1	1	1
Tehama	799	846	758	845	715	487	569	866	813	647	1,391	1,343	2,313
Trinity	921	800	751	760	841	418	340	464	459	650	865	942	901
Tulare	744	939	807	965	890	725	625	836	924	1,108	1,206	1,240	1,735
Tuolumne	213	213	212	280	329	215	175	218	223	257	451	594	795
Ventura	274	362	346	308	390	317	408	398	465	554	972	885	834
Yolo	115	169	176	214	191	138	88	91	106	151	209	217	283
Yuba	53	52	55	93	91	34	31	56	40	42	102	101	113
County not given	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	31	3
Totals	19,507	21,515	21,222	24,132	25,805	18,380	17,686	20,805	21,955	25,008	32,241	35,045	43,250
Deer Tag License Sales	110,760	105,638	115,472	123,999	129,005	96,702	95,776	108,913	110,808	126,855	128,436	141,598	152,924

PREDATORY ANIMAL CATCH BY COUNTIES

County	July 1, 1938, to June 30, 1939				July 1, 1939, to June 30, 1940				Total for biennium
	Coyote	Bobcat	Other predators	Total	Coyote	Bobcat	Other predators	Total	
Amador	22	3	4	29	20	8	5	33	62
Calaveras					102	11	9	122	122
El Dorado					29	3	11	43	43
Fresno	140	48	87	275	84	13	24	121	396
Glenn					2	3	50	55	55
Humboldt	4	155	117	276	1	74	64	139	415
Inyo	21	5		26	117	4	27	148	174
Kern	520	105	18	643	249	47	15	311	954
Lake	13	10	19	42	20	7	24	51	93
Lassen	88	7	22	117	142	8	36	186	303
Los Angeles	114	25	80	219	140	55	71	266	485
Madera					40	16	87	143	143
Mariposa	39	8	42	89	32	2	33	67	156
Mendocino	1	8	17	26					26
Merced					57		73	130	130
Modoc	68	3	26	97	42	2	7	51	148
Mono	84	3		87					87
Monterey	250	257	99	606	82	49	72	203	809
Napa	18	44	50	112	2	5	27	34	146
Nevada	74	14	203	291	157	15	186	358	649
Orange					75	25	29	129	129
Placer	20	6	47	73					73
Plumas	27	1		28					28
Riverside	248	93	147	488	23	14	6	43	531
San Benito	311	142	176	629	288	176	121	585	1,214
San Bernardino	193	38	78	309	264	42	70	376	685
San Diego	48	11	30	89	167	49	143	359	448
San Mateo	1	12	11	24					24
Santa Barbara	140	50	46	236	272	51	141	464	700
Santa Clara		1		1					1
Santa Cruz					9	6	17	32	32
Shasta	88	21	65	174	48	11	19	78	252
Siskiyou	32	7	26	65	92	14	90	196	261
Stanislaus	18	4		22					22
Trinity	23	14	29	66	51	8	48	107	173
Tulare	11	9	88	108	57	22	232	311	419
Tuolumne	80	10	7	97	40	2		42	139
Ventura	93	9	45	147	304	52	95	451	598
Totals	2,789	1,123	1,579	5,491	3,008	794	1,832	5,634	11,125

	1938-1939	*1939-1940*
Average number of trappers	19	19
Miles of trapline	220,452	290,282
Number of sets	256,086	231,198
Number of days	5,238	5,426

ARRESTS AND CONVICTIONS
RECAPITULATION

	Number of arrests	Fines imposed	Jail sentences (days)
Fish cases, 1938-1939	2,213	$50,043 50	4,947
Game cases, 1938-1939	1,796	41,307 50	10,055½
Totals, 1938-1939	4,009	$91,351 00	15,002½
Fish cases, 1939-1940	1,736	$47,870 00	3,868½
Game cases, 1939-1940	1,699	48,875 50	8,804
Totals, 1939-1940	3,435	$96,745 50	12,672½
Recapitulation—			
1938-1939	4,009	$91,351 00	15,002½
1939-1940	3,435	96,745 50	12,672½
Totals	7,444	$188,096 50	27,675

TOTAL ARRESTS FOR A PERIOD OF THIRTY-EIGHT YEARS

1902-1904	550
1904-1906	774
1906-1908	1,192
1908-1910	1,771
1910-1912	2,063
1912-1914	1,993
1914-1916	2,087
1916-1918	1,797
1918-1920	1,891
1920-1922	2,258
1922-1924	2,715
1924-1926	3,207
1926-1928	4,390
1928-1930	5,388
1930-1932	5,237
1932-1934	3,795
1934-1936	4,535
1936-1938	6,382
1938-1940	7,444

1932	1933	1934	1935	1936	1937	1938	1939	Totals	County
1	2	------	1	------	------	------	------	6	Alameda
------	------	------	------	------	------	------	------	3	Alpine
2	1	------	1	------	------	------	------	26	Amador
3	1	3	4	2	1	------	4	59	Butte
9	1	4	------	2	2	1	1	58	Calaveras
8	------	4	4	------	1	------	1	73	Colusa
------	------	------	------	------	------	------	------	------	Contra Costa
8	3	1	4	4	6	11	7	197	Del Norte
10	5	13	3	3	8	------	2	194	El Dorado
4	2	4	------	4	3	6	16	128	Fresno
18	9	5	7	8	9	11	7	180	Glenn
19	29	22	28	19	24	25	28	935	Humboldt
------	------	------	------	------	------	------	------	2	Imperial
------	------	------	------	------	------	------	1	19	Inyo
7	6	6	4	5	5	12	5	359	Kern
------	------	------	------	------	------	------	------	1	Kings
21	11	11	13	13	12	15	10	427	Lake
------	1	2	------	------	------	------	------	12	Lassen
4	1	3	2	3	8	5	6	167	Los Angeles
------	------	8	3	1	2	4	3	73	Madera
------	1	------	------	------	------	------	------	2	Marin
------	1	3	------	------	------	1	4	138	Mariposa
24	21	5	13	4	12	16	21	543	Mendocino
------	------	------	------	------	------	------	------	5	Merced
------	------	------	------	------	------	------	------	5	Modoc
------	1	------	------	------	------	------	------	18	Mono
23	3	2	19	8	17	11	19	475	Monterey
------	------	------	------	------	------	1	------	4	Napa
1	4	6	1	------	1	1	5	31	Nevada
2	------	------	------	2	------	------	------	13	Orange
2	9	1	5	3	------	7	4	114	Placer
1	------	3	1	------	------	------	------	18	Plumas
2	7	6	8	1	2	3	------	91	Riverside
------	------	------	------	------	------	------	------	1	Sacramento
2	3	2	------	------	------	1	------	60	San Benito
5	7	8	2	7	4	4	15	133	San Bernardino
13	5	12	12	12	14	4	11	214	San Diego
------	------	------	------	------	------	------	------	------	San Francisco
------	------	------	------	------	------	------	------	2	San Joaquin
5	7	------	1	1	2	4	5	200	San Luis Obispo
------	------	------	------	------	------	------	------	1	San Mateo
26	17	14	20	7	5	11	11	385	Santa Barbara
7	7	6	13	3	2	5	1	99	Santa Clara
------	------	------	------	------	------	------	------	4	Santa Cruz
26	29	20	22	3	18	8	11	589	Shasta
3	4	2	12	1	------	------	------	33	Sierra
3	3	7	12	20	18	18	22	435	Siskiyou
------	------	------	------	------	------	------	------	------	Solano
1	1	1	------	------	------	------	------	30	Sonoma
3	1	1	------	------	------	3	------	25	Stanislaus
------	------	------	------	------	------	------	------	2	Sutter
10	21	7	9	8	6	10	9	361	Tehama
31	26	12	18	18	29	28	50	719	Trinity
8	11	4	7	9	8	15	13	369	Tulare
6	------	3	5	4	3	1	------	173	Tuolumne
1	2	1	1	2	1	9	------	159	Ventura
1	------	------	------	------	------	------	------	1	Yolo
5	6	3	------	------	1	2	------	35	Yuba
325	269	215	255	177	224	253	292	8,406	Totals

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SEIZURES OF FISH AND GAME

Fish	July 1, 1938, to June 30, 1939	July 1, 1939, to June 30, 1940	Total
Abalone	1,401	1,091	2,492
Abalone, pounds	700		700
Abalone, black		31	31
Abalone, red	101	136	237
Barracuda		63	63
Barracuda, pounds	69	2,289	2,358
Bass—			
Black	186	158	344
Black, pounds	157	18	175
Calico		29	29
Large-mouth	7		7
White Sea		47	47
White Sea, pounds	4,599	3,937½	8,536½
Striped	198	408	606
Striped, pounds	2,508	1,367½	3,875½
Carp	1	13	14
Catfish	8	25	33
Catfish, pounds	127	830	957
Clams		1,145	1,145
Clams, cockle	1,651	850	2,501
Clams, horseneck	246	20	266
Clams, Pismo	4,473	2,050	6,523
Clams, Pismo, pounds	2		2
Clams, razor	2,500		2,500
Clams, Washington	309		309
Clam rake	1		1
Cod, pounds		40	40
Crabs	1,326	1,374	2,700
Crappie	190	21	211
Crappie, pounds	1	12	13
Grunion		120	120
Halibut	11	1	12
Halibut, pounds	40	217	257
Kingfish, pounds	300		300
Lobsters	1,317	1,215	2,532
Lobsters, pounds	234½	504½	739
Lobsters, pots		20	20
Lobsters, receiver		1	1
Mullet, pounds		150	150
Nets, bass	2		2
Nets, crab	3		3
Nets, fyke		2	2
Perch	153	79	232
Salmon	110	28	138
Salmon, pounds	1,039½	1,101	2,140½
Salmon, King and Silver, pounds		2,500	2,500
Salmon, Silver		1	1
Sardines, tons		50	50
Shad	2		2
Shad, pounds	6	400	406
Shad roe, pounds	190		190
Skipjack, pounds		27,728	27,728
Spear		1	1
Sturgeon	184		184
Sturgeon, pounds		15	15
Sturgeon, head	2		2
Sturgeon, roe	64		64
Sunfish	435	92	527
Sunfish, pounds	1½		1½
Sunfish, Bluegill	683	270	953
Sunfish, Bluegill, pounds		36	36
Traps, bass	43	3	46
Traps, lobster	133	92	225
Trout	980	147	1,127
Trout, Dolly Varden	10		10
Trout, Eastern Brook	206	131	337
Trout, Golden	143		143
Trout, Loch Leven	14	7	21
Trout, Mackinaw, pounds		18	18
Trout, Rainbow	36	297	333
Trout, Rainbow, pounds	58½		58½
Trout, Steelhead	191	119	310
Trout, Steelhead, pounds	114½	99½	214
Tuna, Bluefin	3	1	4
Tuna, Bluefin, tons	62½		62½
Tuna, Yellowfin, pounds	1,320	17,090	18,410
Yellowtail	1,854	16	1,870
Yellowtail, pounds	6,000		6,000

SEIZURES OF FISH AND GAME—Continued

Game	July 1, 1938, to June 30, 1939	July 1, 1939, to June 30, 1940	Total
Antelope horns	2		2
Avocets	1		1
Bears, brown	1		1
Bearmeat, pounds		10	10
Bearmeat, hindquarters	1		1
Bearskin	1		1
Bird net	1	1	2
Brant, black sea	1		1
Coots	23	3	26
Curlew, Hudsonian	1		1
Deer	22½	86	108½
Deerhead	1		1
Deerhides	2	2	4
Deermeat, pounds	7,491	3,537½	11,028½
Deerskin	5		5
Doves	439	277	716
Dowitcher		10	10
Ducks	668	652	1,320
Ducks, mallards	759		759
Mallards, wood	1		1
Geese	121	115	236
Geese, Canada	6		6
Godwit, Hudsonian	5		5
Grebe	6		6
Grouse	5		5
Herons		2	2
Honkers		2	2
Killdeer	6	7	13
Meadowlark	2		2
Mudhens	16		16
Muskrat hides		38	38
Non-game birds	3		3
Partridges, chukar		7	7
Pheasants	144	117	261
Pigeons	7	11	18
Pigeons, bandtailed	1		1
Plover	5		5
Quail	198	78	276
Rabbits	32	105	137
Rabbits, brush	16	2	18
Rabbits, cottontails	25		25
Rabbits, jack	3		3
Robins	134	18	152
Sagehen	3	1	4
Sandpiper	6		6
Seagull		1	1
Sea otter skins		1	1
Shorebirds	6	53	59
Sparrows	1	2	3
Squirrels	2	4	6
Squirrels, tree hides		2	2
Swans	4	2	6
Teal, blue-wing		5	5
Turkeys, wild		2	2
Wood Ibis	2		2

FISH CASES

Offense	July 1, 1938, to June 30, 1939			July 1, 1939, to June 30, 1940		
	Arrests	Fines	Jail	Arrests	Fines	Jail
Abalones: undersized, overlimit, red, using diving apparatus to take, transporting, undersized green, black, closed season, out of shell	229	$4,218 00	81	93	$1,835 00	172
Angling: No license, closed season, fail to show license on demand, transfer license, too close to dam, less than 250 feet from fish ladder, at night, 2 poles and more than 2 attractors, false statement on license, with illegal gear, in refuge	408	4,891 00	320½	324	4,330 50	394½
Barracuda: No license, undersized	4	40 00				
Bass: Undersized, no license, striped, take young bass for bait, selling sea-bass, bass traps in Dist. 19, night fishing, calico, white sea bass, closed season, night buying or selling, trawling for striped bass with 2 lines, overlimit calico	282	4,456 00	646	346	6,054 00	522½
Catfish: Retaining in live box, take with traps, selling closed season, undersized, overlimit, take other than by angling	3		75	7	125 00	
Clams: Closed season, out of shell, Pismo, no license, jackknife no license, undersized cockle clams, undersized, selling, razor, Washington, clam forks in clam preserve	251	3,687 50	1,221½	142	2,198 00	1,211
Corbina: Selling	2					
Commercial fishing: No license, no boat number, no records, fail to register boat and gear	148	2,180 00	80	185	4,180 00	320
Crabs: Undersized, female, closed season	40	615 00	124	16	295 00	37
Crappie: Possession, closed season	21	195 00		5	90 00	12½
Explosives: Using to take fish	1					
Fail to deliver fish receipt records to San Francisco office, fail to keep record of fish sales, to show fish on demand, and to maintain and operate a fishway	1	10 00		4	35 00	
Fish: Take with shovel, take from State ponds	5	75 00	11			
Frogs: Overlimit, undersized	1			1	25 00	
Gaff hooks: Possess within 300 ft. of a stream, using in fish ladder, take salmon, steelhead. Possess by Santa Ynez River	25	205 00	122½	17	425 00	25
Grunion: Closed season				4	40 00	
Halibut: Undersized, sale	1	20 00		1		
Lobsters: Closed season, undersized, oversized	49	1,090 00	399	49	1,230 00	204½
Minnows: Selling, no license				1	25 00	
Mollusks: Taking without commercial license, fail to show on demand	3	65 00				
Mullet: Taking and selling, no commercial license				2		15
Nets: Destroy anothers, using drag nets, drift gill nets in Dist. 15, gill net in Klamath River District, in Smith River, fyke net, no commercial license. Operate in Dist. 3, fyke nets in closed waters, in Cache Slough, in Mokelumne River, cutting net being legally used, nets with meshes less than 2½ in. gill net in Dist. 12-B, round haul net to take barracuda and yellowtail in closed season	86	3,682 50	295	116	6,056 00	640
Obstructing stream to fish				1	100 00	
Operate party fishing boat without license	6	50 00				
Oysters: Taking from private beds	3	75 00				
Perch: Taking from closed stream, no license	10	167 50		2	25 00	
Pollution	69	9,875 00	35	78	11,500 00	
Postdating a license				1	100 00	
Reduction plant: No license, wastage, using whole fish				4	400 00	
Salmon: Overlimit, spearing, take with gill net, closed season, night, operating salmon fence in Stanislaus River, selling untagged, undersized king and silver, no license, fail to show on demand, take with pitchfork	79	1,009 00	612½	72	1,690 00	107½
Sardines: No commercial license, reducing more than 32½% of sardines accepted for canning	2	115 00		4	70 00	
Seines: Illegal use, purse seines in Dist. 20, operate beach seine in Dist. 2-B, operate purse seine in closed waters	77	4,805 00	300			
Set lines: In Georgiana Slough, in Honker Bay, in Dist. 1, in Dist. 12-C, using to take striped bass	30	1,130 00	12½	17	915 00	37½
Shoot fish	1	50 00				
Shrimps: Retaining fish other than shrimp in shrimp trowl				1	135 00	
Skipjack: Sale of underweight				4	200 00	

FISH CASES—Continued

Offense	July 1, 1938, to June 30, 1939			July 1, 1939, to June 30, 1940		
	Arrests	Fines	Jail	Arrests	Fines	Jail
Spear: Possess within 300 ft. of stream, in Dist. 1, possess on river, Woodbridge Dam, on stream closed to spearing	78	$939 00	82	49	$1,735 00	30
Spotfin croaker: No license	2	10 00				
Sunfish: No license, closed season, possess bluegill sunfish, overlimit	109	1,147 00	114½	59	925 50	88½
Traps: Possess fish taken in fish trap, operating fish trap	5	150 00		4	75 00	
Trout: Using 2 poles, closed season, overlimit, take with set lines, bringing into State and failing to tag, possession steelhead, take with explosives, eastern brook, rainbow, selling, prohibited gear, spearing steelhead, snagging, take with shovel	167	3,834 00	415	122	2,706 00	51
Tuna: Bluefin, operating purse seine to take yellowfin, no license, sale of underweight, possess underweight yellowfin	5	1,125 00		4	250 00	
Waste of food fish	2	50 00				
Yellowfin croaker: No license, undersized	2	7 00		1	100 00	
Yellowtail: Overlimit, sale for salting, no license	6	75 00				
Totals	2,213	$50,043 50	4,947	1,736	$47,870 00	3,868½

GAME CASES

Offense	July 1, 1938, to June 30, 1939			July 1, 1939, to June 30, 1940		
	Arrests	Fines	Jail	Arrests	Fines	Jail
Antelope: Possession horns and parts of hide	2	$50 00				
Bear: Possession bear meat closed season, in refuge, no permit	4	125 00		4	$165 00	45
Bird nets: Possession	2	12 50				
Brant: Taking black, closed season	1	25 00		1		10
Commercial Gun Club: No license	2	50 00		1		25
Coots: Possession in closed season, taking after four, overlimit, possession no license	21	225 00	174	7	55 00	10
Deer: Possess deer meat closed season, take with spotlight, spike buck, allowing dogs to run deer, hides, evidence of sex removed, fail to fill out tag, take female deer, hunting deer at night, fail to retain hide and antlers in possession, possess spotted fawn, forked horn in Dist. 1¾, failure to tag, deface and altering tag, fail to have tag validated, erasing tag, shoot spotted fawn	548	15,382 50	6,265	538	23,557 00	6,438½
Doves: Closed season, illegal shipment, shoot from auto, no license, overlimit	118	2,437 50	52½	148	3,187 00	360
Ducks: Closed season, shoot before 7 a.m., possess wood ducks, selling ducks, taking eggs, no duck stamp	296	8,362 50	1,997	185	4,725 00	544½
Elk hide: Unlawful possession				1	10 00	
Firearms: In game refuge, discharge in refuge	75	825 00	157½	154	2,330 00	80
Fox: Closed season, no license	1					
Frogs: Possession, undersized	1	25 00				
Game: Fail to show on demand, take with spotlight, possession gun and spotlight in game area	8	210 00				
Game birds: Closed season, no license, shoot from auto; shoot from powerboat	18	340 00		1	5 00	
Geese: Closed season, overlimit, possess illegally wild goose	69	992 00	20	32	765 00	1
Grebe: Killing	8	150 00		1		
Grouse	3	50 00		1	25 00	
Heron: Taking				2	50 00	
Hunting: No license, night hunting from auto, closed season in game refuge, with anothers license, false statement to obtain hunting license	189	2,670 00	550	175	3,218 00	397
Killdeer: Possession, killing	1	10 00		2	10 00	
Larks: No license, shoot from auto				2	50 00	
Meadowlarks: Possession	3	10 00	20			
Mink: Trapping for profit	1	10 00				
Mudhens: Closed season	5	20 00	12½	1	10 00	
Nongame birds: Possession	3	85 00		25	365 00	37½
Partridges: Kill chukar, unlawful sale				2	5 00	
Pheasants: Closed season, overlimit, female, shoot from auto, operate snares	151	4,690 00	435	129	5,147 50	670
Pigeons: Closed season, band-tailed closed season, overlimit	8	105 00		5	60 00	
Plover: Possession	2	25 00	12½	1	100 00	
Quail: Closed season, no license, possess valley quail, take with trap	77	1,673 50	159½	45	1,040 00	44
Rabbits: No license, cottontails, closed season, brush rabbits, shoot from auto, spotlighting, night hunting	76	734 50	31	84	1,232 00	61½
Rail: Killing	3	50 00				
Refuge: Take mammal in refuge	5	200 00				
Robins: Possession of	25	460 00	132	3	100 00	
Sagehen: Closed season, possession parts of	2	50 00		7	175 00	
Seal: Killing	1					
Sea Otter: Possess skin				1	50 00	
Shooting: In game refuge, from highway, from auto, from public road, early, from powerboat, with shotgun holding more than six shells	17	457 50		80	1,429 00	12½
Shorebirds: Taking, possession, shooting protected	17	380 00		32	585 00	3
Spotlighting	4			1	25 00	
Squirrel: Possession tree squirrel	4	35 00	37	10	115 00	25
Swan: Possession	7	170 00		2	25 00	15
Trapping: No license, fail to send records to San Francisco office, remove anothers traps, stealing traps, robbing traps of licensed trapper, theft of No. 3 Victor traps	17	160 00		12	185 00	12
Waterfowl: Hunting at night				4	75 00	12½
Wood ibis: Possession	1	50 00				
Totals	1,796	$41,307 50	10,055½	1,699	$48,875 50	8,804

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH AND GAME, RECORD OF FISH DISTRIBUTION

RECAPITULATION

TROUT

Rainbow	7,654,318
Loch Leven	5,172,201
Steelhead	5,062,974
Eastern Brook	5,093,497
Black Spotted	506,230
Golden	987,736
Total	24,476,956

SALMON

Silver	1,111,385
King	6,822,596
Chum	153,350
Total	8,087,331

SPINY RAYED

Small Mouthed Black Bass	123,597
Kentucky Bass	25,654
Total	149,251

Grand total	32,713,538

GENERAL FISH RESCUE

TROUT

Loch Leven	900
Steelhead	39,629
Cutthroat	825
Total	41,354

SALMON

King	81,640
Silver	88,045
Total	169,685

SPINY RAYED

Shad	2,523
Small Mouthed Black Bass	128,450
Large Mouthed Black Bass	1,653,178
Striped Bass	1,324
Calico Bass	20,315
Rock and Warmouth Bass	69,955
Sacramento Perch	1,379
Crappie	849,731
Square Tailed Catfish	9,321,635
Forked Tail Catfish	1,188,913
Bluegill Sunfish	1,324,952
Green Sunfish	826,928
Mottled Sunfish	4,172
Total	15,393,455

Grand total	15,604,494

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DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

Hatchery	County	Total from county by hatchery	Rainbow	Steelhead
ALPINE	Alpine	539,760		
	Mono	5,000		
BASIN CREEK	Alpine	43,070	18,070	
	Calaveras	341,965	161,130	
	Tuolumne	609,085	167,370	110,780
BEAR RIVER BASE	Nevada	787,980	237,400	
	Placer	339,860	138,800	44,840
	Sierra	21,200		
BIG CREEK	Monterey	210,000		100,000
	San Francisco	2,030		30
	San Mateo	300,000		300,000
	Santa Clara	57,240		28,000
	Santa Cruz	514,002		436,942
BROOKDALE	Alameda	29,200		
	Monterey	143,480		123,480
	San Benito	21,000		12,000
	San Luis Obispo	30,000		30,000
	San Mateo	5,000		5,000
	Santa Clara	78,710		43,000
	Santa Cruz	522,440		435,800
BURNEY CREEK	Lassen	75,000	50,000	
	Modoc	364,000	157,000	
	Shasta	923,400	278,445	
FALL CREEK	Siskiyou	5,556,000	1,443,000	
FEATHER RIVER	Plumas	734,250	359,750	
	Sierra	184,950	53,800	
FERN CREEK	Fresno	41,000	41,000	
	Madera	112,000	112,000	
	Mono	206,580	199,380	
FOREST HOME	Los Angeles	27,000	27,000	
	San Bernardino	6,000	6,000	
FORT SEWARD	Humboldt	1,640,881		770,000
	Lake	30,000		30,000
	Marin	55,000		55,000
	Mendocino	209,000		209,000
	Napa	35,000		35,000
	Trinity	30,000		30,000
HOT CREEK	Mono	479,016	219,408	
HUNTINGTON LAKE	Fresno	238,250		
KAWEAH	Fresno	44,500		
	Kern	75,000	75,000	
	Tulare	834,500	199,200	
LAKE ALMANOR	Lassen	263,400	13,000	25,000
	Plumas	941,250	258,900	280,000
	Shasta	12,000	12,000	
	Tehama	96,500	21,500	
MADERA	Madera	210,650		
MT. SHASTA	Alpine	53,200	40,000	
	Amador	220,800	70,000	
	Butte	467,000	262,000	
	Colusa	10,000	10,000	
	El Dorado	659,000	341,000	50,000
	Glenn	16,000	16,000	
	Placer	25,000	25,000	
	Plumas	65,000	35,000	
	San Francisco	4,900		
	Shasta	383,046	205,000	
	Siskiyou	3,084,276	347,000	50,000
	Tehama	338,000	85,000	
	Trinity	688,500	485,000	49,000
	Yuba	20,000	20,000	

AND GAME, RECORD OF FISH DISTRIBUTION—Continued

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Chum Salmon	Miscellaneous	Total
	436,760			103,000					
	5,000								544,760
				25,000					
			180,835						
			198,740	132,195					994,120
			371,680	178,900					
			108,820	47,400					
			21,200						1,149,040
			110,000						
						2,000			
			29,240						
						77,060			1,083,272
			20,200						
			20,000						
			9,000						
			35,710						
						86,640			829,830
			25,000						
			77,000	130,000					
			254,705	390,250					1,362,400
					4,113,000				5,556,000
			153,800	220,700					
			55,300	75,850					919,200
	7,200								359,580
									33,000
					484,236	386,645			
									1,999,881
23,448	57,270		110,232	68,658					479,016
			68,025	170,225					238,250
			17,500	27,000					
			250,000	385,300					954,000
			35,000	190,400					
			191,000	58,000			153,350		
			15,000	60,000					1,313,150
			149,100	61,550					210,650
				13,200					
			95,000	55,800					
			205,000						
			195,000	73,000					
				30,000					
			2,100		2,800				
			173,046	5,000					
			46,402	421,674	2,219,200				
			175,000	78,000					
				154,500					6,034,722

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

Hatchery	County	Total from county by hatchery	Rainbow	Steelhead
MT. SHASTA EXPERIMENTAL	Shasta	5,400	5,000	
	Siskiyou	16,013	7,971	
MT. TALLAC	El Dorado	612,590	316,790	295,800
	Nevada	149,500	149,500	
	Placer	56,500	11,500	45,000
MT. WHITNEY	Fresno	286,466	14,028	
	Inyo	861,279	296,616	
	Kern	175,550	75,110	
	Los Angeles	30,000		30,000
	Madera	30,012	30,012	
	Mono	1,265,618	134,601	
	San Bernardino	50,022		50,022
	Tulare	120,640		
	Ventura	100,000		100,000
PRAIRIE CREEK	Del Norte	476,880		323,380
	Humboldt	1,057,600		648,700
	Lake	56,000		56,000
	Mendocino	155,500		155,500
	Sonoma	10,400		10,400
	Trinity	95,300		95,300
TAHOE	Eldorado	732,800	11,700	
	Placer	388,780	1,940	
	Ormsby, Nevada	90,000		
YOSEMITE	Madera	10,000		
	Mariposa	678,800	251,000	
	Tuolumne	574,000	62,000	
YUBA RIVER	Nevada	66,972		
	Sierra	350,794	96,397	
Totals		32,564,287	7,654,318	5,062,974

AND GAME, RECORD OF FISH DISTRIBUTION—Continued

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Chum Salmon	Miscellaneous	Total
			200	200					
			8,042						21,413
									818,590
246,050				26,388					
156,310			205,285	203,068					
			100,440						
141,288			466,880	522,849					
120,640									
									2,919,587
						153,500			
					3,360	405,540			
									1,851,680
100,000			115,000	506,100					
			322,100	64,740					
				90,000					1,211,580
				10,000					
			332,000	95,800					
200,000			86,000	226,000					1,262,800
			56,928	10,044					
			71,691	182,706					417,766
987,736	506,230		5,172,201	5,093,497	6,822,596	1,111,385	153,350		32,564,287

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

County	Hatchery	Total from hatchery by county	Rainbow	Steelhead
ALAMEDA	Brookdale	29,200		
ALPINE	Alpine	539,760		
	Basin Creek	43,070	18,070	
	Mt. Shasta	53,200	40,000	
AMADOR	Mt. Shasta	220,800	70,000	
BUTTE	Mt. Shasta	467,000	262,000	
CALAVERAS	Basin Creek	341,965	161,130	
COLUSA	Mt. Shasta	10,000	10,000	
DEL NORTE	Prairie Creek	476,880		323,380
EL DORADO	Mt. Shasta	659,000	341,000	50,000
	Mt. Tallac	612,590	316,790	295,800
	Tahoe	732,800	11,700	
FRESNO	Fern Creek	41,000	41,000	
	Huntington Lake	238,250		
	Kaweah	44,500		
	Mt. Whitney	286,466	14,028	
GLENN	Mt. Shasta	16,000	16,000	
HUMBOLDT	Fort Seward	1,640,881		770,000
	Prairie Creek	1,057,600		648,700
INYO	Mt. Whitney	861,279	296,616	
KERN	Kaweah	75,000	75,000	
	Mt. Whitney	175,550	75,110	
LAKE	Fort Seward	30,000		30,000
	Prairie Creek	56,000		56,000
LASSEN	Burney Creek	75,000	50,000	
	Lake Almanor	263,400	13,000	25,000
LOS ANGELES	Forest Home	27,000	27,000	
	Mt. Whitney	30,000		30,000
MADERA	Fern Creek	112,000	112,000	
	Madera	210,650		
	Mt. Whitney	30,012	30,012	
	Yosemite	10,000		
MARIN	Fort Seward	55,000		55,000
MARIPOSA	Yosemite	678,800	251,000	
MENDOCINO	Fort Seward	209,000		209,000
	Prairie Creek	155,500		155,500
MODOC	Burney Creek	364,000	157,000	
MONO	Alpine	5,000		
	Fern Creek	206,580	199,380	
	Hot Creek	479,016	219,408	
	Mt. Whitney	1,265,618	134,601	
MONTEREY	Big Creek	210,000		100,000
	Brookdale	143,480		123,480
NAPA	Fort Seward	35,000		35,000
NEVADA	Bear River Base	787,980	237,400	
	Mt. Tallac	149,500	149,500	
	Yuba River	66,972		
PLACER	Bear River Base	339,860	138,800	44,840
	Mt. Shasta	25,000	25,000	
	Mt. Tallac	56,500	11,500	45,000
	Tahoe	388,780	1,940	

AND GAME, RECORD OF FISH DISTRIBUTION—Continued

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Chum Salmon	Miscellaneous	Total
			29,200						29,200
	436,760			103,000					
				25,000					
				13,200					636,030
			95,000	55,800					220,800
			205,000						467,000
			180,835						341,965
									10,000
						153,500			476,880
			195,000	73,000					
100,000			115,000	506,100					2,004,390
			68,025	170,225					
			17,500	27,000					
246,050				26,388					610,216
									16,000
					484,236	386,645			
					3,360	405,540			2,698,481
156,310			205,285	203,068					861,279
			100,440						250,550
									86,000
			25,000						
			35,000	190,400					338,400
									57,000
			149,100	61,550					
				10,000					362,662
									55,000
			332,000	95,800					678,800
									364,500
			77,000	130,000					364,000
	5,000								
	7,200								
23,448	57,270		110,232	68,658					
141,288			466,880	522,849					1,956,214
			110,000						
			20,000						353,480
									35,000
			371,680	178,900					
			56,928	10,044					1,004,452
			108,820	47,400					
			322,100	64,740					810,140

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

County	Hatchery	Total from hatchery by county	Rainbow	Steelhead
PLUMAS	Feather River	734,250	359,750	
	Lake Almanor	941,250	253,900	280,000
	Mt. Shasta	65,000	35,000	
SAN BENITO	Brookdale	21,000		12,000
SAN BERNARDINO	Forest Home	6,000	6,000	
	Mt. Whitney	50,022		50,022
SAN FRANCISCO	Big Creek	2,030		30
	Mt. Shasta	4,900		
SAN LUIS OBISPO	Brookdale	30,000		30,000
SAN MATEO	Big Creek	300,000		300,000
	Brookdale	5,000		5,000
SANTA CLARA	Big Creek	57,240		28,000
	Brookdale	78,710		43,000
SANTA CRUZ	Big Creek	514,002		436,942
	Brookdale	522,440		435,800
SHASTA	Burney Creek	923,400	278,445	
	Lake Almanor	12,000	12,000	
	Mt. Shasta	383,046	205,000	
	Mt. Shasta Exp.	5,400	5,000	
SIERRA	Bear River Base	21,200		
	Feather River	184,950	53,800	
	Yuba River	350,794	96,397	
SISKIYOU	Fall Creek	5,556,000	1,443,000	
	Mt. Shasta	3,084,276	347,000	50,000
	Mt. Shasta Exp.	16,013	7,971	
SONOMA	Prairie Creek	10,400		10,400
TEHAMA	Lake Almanor	96,500	21,500	
	Mt. Shasta	338,000	85,000	
TUOLUMNE	Basin Creek	609,085	167,370	110,780
	Yosemite	574,000	62,000	
TRINITY	Fort Seward	30,000		30,000
	Mt. Shasta	688,500	485,000	49,000
	Prairie Creek	95,300		95,300
TULARE	Kaweah	834,500	199,200	
	Mt. Whitney	120,640		
VENTURA	Mt. Whitney	100,000		100,000
YUBA	Mt. Shasta	20,000	20,000	
MARLETTE LAKE EGG COLLECTING STATION (NEVADA)	Tahoe	90,000		
Totals		32,564,287	7,654,318	5,062,974

AND GAME, RECORD OF FISH DISTRIBUTION—Continued

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Chum Salmon	Miscellaneous	Total
			153,800	220,700					
			191,000	58,000			153,350		
				30,000					1,740,500
			9,000						21,000
									56,022
						2,000			
			2,100		2,800				6,930
									30,000
									305,000
			29,240						
			35,710						135,950
						77,060			
						86,640			1,036,442
			254,705	390,250					
			173,046	5,000					
			200	200					1,323,846
			21,200						
			55,300	75,850					
			71,691	182,706					556,944
					4,113,000				
			46,402	421,674	2,219,200				
			8,042						8,656,289
									10,400
			15,000	60,000					
			175,000	78,000					434,500
			198,740	132,195					
200,000			86,000	226,000					1,183,085
				154,500					
									813,800
			250,000	385,300					
120,640									955,140
									100,000
									20,000
				90,000					90,000
987,736	506,230		5,172,201	5,093,497	6,822,596	1,111,385	153,350		32,564,287

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

FISH

County	Hatcheries	Shad	Small Mouth Black Bass	Large Mouth Black Bass	Kentucky Bass	Striped Bass
CALAVERAS	Central Valleys Fish Rescue			20,510		
FRESNO	Central Valleys Fish Rescue		1	27,685		
IMPERIAL	So. California Fish Rescue			6,000		
KERN	Central Valleys Fish Rescue			16,350		
KINGS	Central Valleys Fish Rescue			3,644		
LAKE	Central Valleys Fish Rescue			1,001		
LOS ANGELES	So. California Fish Rescue			18,300		
MADERA	Central Valleys Fish Rescue			37,800		
MARIPOSA	Central Valleys Fish Rescue			4,000		
MONTEREY	Central Valleys Fish Rescue			11,000		
MERCED	Central Valleys Fish Rescue		562	7,606		
NAPA	Central Valleys Fish Rescue		52,028			
RIVERSIDE	So. California Fish Rescue			77,030		
SACRAMENTO	Central Valleys Fish Rescue		6,630	1,111,513		
SAN BENITO	Central Valleys Fish Rescue			2,500		
SAN BERNARDINO	So. California Fish Rescue			6,000		
SAN FRANCISCO	Central Valleys Fish Rescue		25			
SAN JOAQUIN	Central Valleys Fish Rescue	362	104	165,303		374
SANTA CRUZ	Central Valleys Fish Rescue			9,000		
SOLANO	Central Valleys Fish Rescue		66,200	100		50
SONOMA	Central Valleys Fish Rescue			100		
STANISLAUS	Central Valleys Fish Rescue	361		29,607		
SUTTER	Central Valleys Fish Rescue			17,500		
TULARE	Central Valleys Fish Rescue			2,210		
TUOLUMNE	Central Valleys Fish Rescue			60,460		
YOLO	Central Valleys Fish Rescue	1,800	2,900	448		900
YUBA	Central Valleys Fish Rescue			17,511		
STATE OF NEVADA, COUNTY OF CHURCHILL	Central Valleys Fish Rescue					
Totals		2,523	128,450	1,653,178		1,324

TROUT AND SAL

County	Hatchery	Rainbow	Steelhead
BUTTE	Central Valleys		
DEL NORTE	Prairie Creek		20,687
HUMBOLDT	Prairie Creek		17,929
SANTA CLARA	Central Valleys		1,013
Totals			39,629

SPINY-RAYED FISH REARED AND PLANTED

County	Hatchery	Total for hatchery by county	Small Mouth Black Bass	Large Mouth Black Bass	Kentucky Bass	Striped Bass
BUTTE	Central Valleys	30,363	30,363			
FRESNO	Central Valleys	3,084	3,084			
KERN	Central Valleys	17,453	17,453			
SACRAMENTO	Central Valleys	49,032	37,774		11,258	
SAN DIEGO	Central Valleys	12,388	12,388			
STANISLAUS	Central Valleys	27,452	13,056		14,396	
YOLO	Central Valleys	9,479	9,479			
Totals		149,251	123,597		25,654	

AND GAME, RECORD OF FISH DISTRIBUTION—Continued

RESCUE

Calico Bass	Sacramento Perch	Crappie	Squaretail Catfish	Forkedtail Catfish	Bluegill Sunfish	Green Sunfish	Mottled Sunfish	Warmouth and Rock Bass	Total
		800	300	16,795	2,150		25		40,580
	504	37,040	61,946	28,632	16,283	25,617			197,708
					20,000				26,000
		725	1,520		125	1,000			19,720
	275	3,509	4,327	4,475	1,800	7,175			25,205
	7		158,500	501	26	25			160,060
					122,000				140,300
		7,200	3,650		1,975	6,000			56,625
					150				4,150
		400		1,000	1,500	1,000	350		15,250
	12	31,387	12,780	110	14,646	7,497	1,350		75,950
				14,062					66,090
					85,000				162,030
		642,321	3,082,655	577,370	832,029	367,010	639	68,436	6,688,603
						1,000			3,500
									6,000
15	17		225	25	50	25			382
		59,133	5,917,788	266,706	103,593	82,849	1,050	1,514	6,598,776
		1,000	3,000			5,000			18,000
	304	200		173,385	61,650	90,000			391,889
						100			200
20,300		57,311	39,063	16,932	53,485	96,163	758	5	313,985
			12,000		1,000	41,000			71,500
	210	2,250	11,720	95	2,020	4,175			22,680
		6,000	500	7,500	5,085	5,207			84,752
	50	90	3,661	80,094	385	1,085			91,413
		365	8,000	31		85,000			110,907
				1,200					1,200
20,315	1,379	849,731	9,321,635	1,188,913	1,324,952	826,928	4,172	69,955	15,393,455

MON FISH RESCUE

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Miscellaneous	Miscellaneous	Total
			900						900
		825			47,900	85,645			155,057
					33,740	2,400			54,069
									1,013
		825	900		81,640	88,045			211,039

FROM CENTRAL VALLEYS HATCHERY

Calico Bass	Sacramento Perch	Crappie	Squaretail Catfish	Forkedtail Catfish	Bluegill Sunfish	Green Sunfish	Miscellaneous	Miscellaneous	Total
									30,363
									3,084
									17,453
									49,032
									12,388
									27,452
									9,479
									149,251

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH AND GAME, RECORD OF FISH DISTRIBUTION—Continued

RECAPITULATION—1939

TROUT

Rainbow	13,173,517
Steelhead	3,605,226
Golden	208,070
Black Spotted	1,000,871
Loch Leven	10,778,223
Eastern Brook	5,403,398
Total	34,169,305

SALMON

King	6,653,891
Silver	290,518
Total	6,944,409

SPINY RAYED

Smallmouth Black Bass	84,374
Kentucky Bass	8,120
Total	92,494

GENERAL FISH RESCUE

TROUT

Rainbow	30,500
Steelhead	653,118
Cutthroat	1
Loch Leven	2,320
Eastern Brook	800
Total	686,739

SALMON

King	20,634
Silver	87,485
Total	108,119

SPINY RAYED

Smallmouth Black Bass	31,814
Largemouth Black Bass	789,456
Striped Bass	15,177
Shad	2,000
Sacramento Perch	159
Crappie	228,580
Squaretail Catfish	1,107,234
Forkedtail Catfish	574,858
Bluegill Sunfish	1,179,092
Green Sunfish	2,107,155
Mixed Sunfish	30
Warmouth Bass	8,069
Hardheads	50
Blue Catfish	500
Total	6,044,160

Hatchery	Rainbow	Steelhead	Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Miscellaneous	Miscellaneous	Total
ALPINE	81,200			592,750			165,020					838,970
BASIN CREEK	886,480					759,980	171,355					1,817,815
BEAR RIVER PLANTING BASE	475,695					679,722	237,439					1,392,856
BIG CREEK		400,816							172,018			572,834
BROOKDALE		554,755										554,755
BURNEY CREEK	896,500					1,124,645	488,175					2,509,320
EXPERIMENTAL	87,705	555				82,019	31,520					201,799
FALL CREEK	1,947,790							3,907,000				5,854,790
FEATHER RIVER	566,200					468,800	337,990					1,372,990
FERN CREEK	322,752			296,191								618,943
FOREST HOME	175,000											175,000
FORT SEWARD		986,500						483,851				1,470,351
HOT CREEK	702,673					91,931	73,569					868,173
HUNTINGTON LAKE	290,771						80,290					371,061
KAWEAH	491,600					441,500	276,900					1,210,000
KINGS RIVER	228,215					284,514	172,638					685,367
LAKE ALMANOR	686,500					895,300	447,800					2,029,600
LYTLE CREEK	5,550					45,720						51,270
MADERA	164,905					190,395	141,725					497,025
MOUNTAIN HOME	180,480					477,725						658,205
MOUNT SHASTA	2,006,050					2,749,664	697,500	2,263,040				7,716,254
MOUNT WHITNEY	620,822		208,070			1,313,579	698,935					2,841,406
PRAIRIE CREEK		1,365,200							118,500			1,483,700
TAHOE						566,560	846,090					1,412,650
TALLAC	1,170,100	297,400		111,930								1,579,430
YOSEMITE	866,300					439,000	355,650					1,660,950
YUBA RIVER	320,229					167,169	180,802					668,200
Totals	13,173,517	3,605,226	208,070	1,000,871		10,778,223	5,403,398	6,653,891	290,518			41,113,714

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

Hatchery	County	Total from county by hatchery	Rainbow	Steelhead
ALPINE	Alpine	838,970	81,200	
BASIN CREEK	Alpine	59,135	25,010	
	Calaveras	561,175	232,220	
	Monterey	39,620	39,620	
	Tuolumne	1,157,885	589,630	
BEAR RIVER PLANTING BASE	Nevada	1,052,761	331,555	
	Placer	329,595	144,140	
	Sierra	10,500		
BIG CREEK	Santa Cruz	572,809		400,791
	San Francisco	25		25
BROOKDALE	Alameda	6,000		6,000
	Marin	30,000		30,000
	Monterey	90,000		90,000
	San Mateo	68,000		68,000
	Santa Clara	12,000		12,000
	Santa Cruz	348,755		348,755
BURNEY CREEK	Lassen	199,000	60,000	
	Modoc	465,000	105,000	
	Shasta	1,845,320	731,500	
EXPERIMENTAL	Lassen	19,200		
	Shasta	35,720		
	Siskiyou	65,534	6,360	555
	Tehama	15,000	15,000	
	Trinity	66,345	66,345	
FALL CREEK	Siskiyou	5,854,790	1,947,790	
FEATHER RIVER	Plumas	1,106,830	456,100	
	Sierra	266,160	110,100	
FERN CREEK	Fresno	13,016	13,016	
	Madera	113,988	113,988	
	Mono	491,939	195,748	
FOREST HOME	Los Angeles	32,000	32,000	
	Riverside	15,000	15,000	
	San Bernardino	70,500	70,500	
	Ventura	57,500	57,500	
FORT SEWARD	Humboldt	1,001,351		517,500
	Lake	83,000		83,000
	Mendocino	231,000		231,000
	Sonoma	25,000		25,000
	Trinity	130,000		130,000
HOT CREEK	Inyo	67,800	67,800	
	Madera	61,200	61,200	
	Mono	739,173	573,673	
HUNTINGTON LAKE	Fresno	371,061	290,771	
KAWEAH	Fresno	85,000	25,000	
	Tulare	1,125,000	466,600	
KINGS RIVER	Fresno	685,367	228,215	
LAKE ALMANOR	Butte	20,000		
	Lassen	460,100	80,000	
	Plumas	1,399,500	566,500	
	Shasta	40,000	40,000	
	Tehama	110,000		
LYTLE CREEK	Los Angeles	15,000		
	San Bernardino	36,270	5,550	
MADERA	Madera	497,025	164,905	

AND GAME, RECORD OF FISH DISTRIBUTION—Continued

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Miscellaneous	Miscellaneous	Total
	592,750			165,020					838,970
				34,125					
			328,955						
			431,025	137,230					1,817,815
			539,902	181,304					
			129,320	56,135					
			10,500						1,392,856
						172,018			
									572,834
									554,755
			44,000	95,000					
			255,000	105,000					
			825,645	288,175					2,509,320
				19,200					
			35,720						
			46,299	12,320					
									201,799
					3,907,000				5,854,790
			363,800	286,930					
			105,000	51,060					1,372,990
	296,191								618,943
									175,000
					483,851				
									1,470,351
			91,931	73,569					868,173
				80,290					371,061
			40,000	20,000					
			401,500	256,900					1,210,000
			284,514	172,638					685,367
				20,000					
			138,300	241,800					
			757,000	76,000					
				110,000					2,029,600
			15,000						
			30,720						51,270
			190,395	141,725					497,025

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

Hatchery	County	Total from county by hatchery	Rainbow	Steelhead
MOUNTAIN HOME	Los Angeles	144,125	10,000	
	Riverside	133,000	28,000	
	San Bernardino	356,080	117,480	
	San Diego	25,000	25,000	
MOUNT SHASTA	Alpine	57,000	50,000	
	Amador	272,000	40,000	
	Butte	718,000	312,000	
	El Dorado	602,520	315,000	
	Placer	25,000	25,000	
	Shasta	1,206,890	156,000	
	Siskiyou	3,517,404	511,050	
	Tehama	445,000	125,000	
	Trinity	872,440	472,000	
MOUNT WHITNEY	Fresno	98,756	46,896	
	Inyo	1,136,517	364,566	
	Kern	250,048	150,000	
	Madera	22,900	1,540	
	Mono	1,313,965	57,820	
	Tulare	19,220		
PRAIRIE CREEK	Del Norte	394,800		394,800
	Humboldt	1,011,200		892,700
	Napa	27,500		27,500
	Trinity	50,200		50,200
TAHOE	El Dorado	647,170		
	Nevada	8,000		
	Placer	688,680		
	San Francisco	3,450		
	Nevada, State of	65,350		
TALLAC	El Dorado	1,414,430	1,030,100	272,400
	Nevada	100,000	100,000	
	Placer	65,000	40,000	25,000
YOSEMITE	Madera	26,000	12,000	
	Mariposa	1,161,000	599,800	
	Tuolumne	473,950	254,500	
YUBA RIVER	Nevada	200,067	82,548	
	Sierra	468,133	237,681	
Totals		41,113,714	13,173,517	3,605,226

AND GAME, RECORD OF FISH DISTRIBUTION—Continued

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Miscellaneous	Miscellaneous	Total
			134,125						
			105,000						
			238,600						
									658,205
				7,000					
			135,000	97,000					
			406,000						
			165,000	122,520					
			1,050,890						
			662,774	360,980	1,982,600				
			320,000						
			10,000	110,000	280,440				7,716,254
33,840				18,020					
112,980			471,516	187,455					
			100,048						
21,360									
20,670			742,015	493,460					
19,220									2,841,406
						118,500			
									1,483,700
			107,000	540,170					
				8,000					
			459,560	229,120					
				3,450					
				65,350					1,412,650
	111,930								
									1,579,430
				14,000					
			439,000	22,200					
				219,450					1,660,950
			95,319	22,200					
			71,850	158,602					668,200
208,070	1,000,871		10,778,223	5,403,398	6,653,891	290,518			41,113,714

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

County	Hatchery	Total from hatchery by county	Rainbow	Steelhead
ALAMEDA	Brookdale	6,000		6,000
ALPINE	Alpine	838,970	81,200	
	Basin Creek	59,135	25,010	
	Mount Shasta	57,000	50,000	
AMADOR	Mount Shasta	272,000	40,000	
BUTTE	Lake Almanor	20,000		
	Mount Shasta	718,000	312,000	
CALAVERAS	Basin Creek	561,175	232,220	
DEL NORTE	Prairie Creek	394,800		394,800
EL DORADO	Mount Shasta	602,520	315,000	
	Tahoe	647,170		
	Tallac	1,414,430	1,030,100	272,400
FRESNO	Fern Creek	13,016	13,016	
	Huntington Lake	371,061	290,771	
	Kaweah	85,000	25,000	
	Kings River	685,367	228,215	
	Mount Whitney	98,756	46,896	
HUMBOLDT	Fort Seward	1,001,351		517,500
	Prairie Creek	1,011,200		892,700
INYO	Hot Creek	67,800	67,800	
	Mount Whitney	1,136,517	364,566	
KERN	Mount Whitney	250,048	150,000	
LAKE	Fort Seward	83,000		83,000
LASSEN	Burney Creek	199,000	60,000	
	Experimental	19,200		
	Lake Almanor	460,100	80,000	
LOS ANGELES	Forest Home	32,000	32,000	
	Lytle Creek	15,000		
	Mountain Home	144,125	10,000	
MADERA	Fern Creek	113,988	113,988	
	Hot Creek	61,200	61,200	
	Madera	497,025	164,905	
	Mount Whitney	22,900	1,540	
	Yosemite	26,000	12,000	
MARIN	Brookdale	30,000		30,000
MARIPOSA	Yosemite	1,161,000	599,800	
MENDOCINO	Fort Seward	231,000		231,000
MODOC	Burney Creek	465,000	105,000	
MONO	Fern Creek	491,939	195,748	
	Hot Creek	739,173	573,673	
	Mount Whitney	1,313,965	57,820	
MONTEREY	Basin Creek	39,620	39,620	
	Brookdale	90,000		90,000
NAPA	Prairie Creek	27,500		27,500
NEVADA	Bear River Planting Base	1,052,761	331,555	
	Tahoe	8,000		
	Tallac	100,000	100,000	
	Yuba River	200,067	82,548	
NEVADA, STATE OF	Tahoe	65,350		

AND GAME, RECORD OF FISH DISTRIBUTION—Continued

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Miscellaneous	Miscellaneous	Total
									6,000
	592,750			165,020					
				34,125					
				7,000					955,105
			135,000	97,000					272,000
				20,000					
			406,000						738,000
			328,955						561,175
									394,800
			165,000	122,520					
			107,000	540,170					
	111,930								2,664,120
				80,290					
			40,000	20,000					
			284,514	172,638					
33,840				18,020					1,253,200
					483,851				
						118,500			2,012,551
112,980			471,516	187,455					1,204,317
			100,048						250,048
									83,000
			44,000	95,000					
				19,200					
			138,300	241,800					678,300
			15,000						
			134,125						191,125
			190,395	141,725					
21,360									
				14,000					721,113
									30,000
			439,000	122,200					1,161,000
									231,000
			255,000	105,000					465,000
	296,191								
			91,931	73,569					
20,670			742,015	493,460					2,545,077
									129,620
									27,500
			539,902	181,304					
				8,000					
			95,319	22,200					1,360,828
				65,350					65,350

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

County	Hatchery	Total from hatchery by county	Rainbow	Steelhead
PLACER	Bear River Planting Base	323,595	144,140	
	Mount Shasta	25,000	25,000	
	Tahoe	688,680		
	Tallac	65,000	40,000	25,000
PLUMAS	Feather River	1,106,830	456,100	
	Lake Almanor	1,399,500	566,500	
RIVERSIDE	Forest Home	15,000	15,000	
	Mountain Home	133,000	28,000	
SAN BERNARDINO	Forest Home	70,500	70,500	
	Lytle Creek	36,270	5,550	
	Mountain Home	356,080	117,480	
SAN DIEGO	Mountain Home	25,000	25,000	
SAN FRANCISCO	Big Creek	25		25
	Tahoe	3,450		
SAN MATEO	Brookdale	68,000		68,000
SANTA CLARA	Brookdale	12,000		12,000
SANTA CRUZ	Big Creek	572,809		400,791
	Brookdale	348,755		348,755
SHASTA	Burney Creek	1,845,320	731,500	
	Experimental	35,720		
	Lake Almanor	49,000	40,000	
	Mount Shasta	1,206,890	156,000	
SIERRA	Bear River Planting Base	10,500		
	Feather River	266,160	110,100	
	Yuba River	468,133	237,681	
SISKIYOU	Experimental	65,534	6,360	555
	Fall Creek	5,854,790	1,947,790	
	Mount Shasta	3,517,404	511,050	
SONOMA	Fort Seward	25,000		25,000
TEHAMA	Experimental	15,000	15,000	
	Lake Almanor	110,000		
	Mount Shasta	445,000	125,000	
TRINITY	Experimental	66,345	66,345	
	Fort Seward	130,000		130,000
	Mount Shasta	872,440	472,000	
	Prairie Creek	50,200		50,200
TULARE	Kaweah	1,125,000	466,600	
	Mount Whitney	19,220		
TUOLUMNE	Basin Creek	1,157,885	589,630	
	Yosemite	473,950	254,500	
VENTURA	Forest Home	57,500	57,500	
Totals		41,113,714	13,173,517	3,605,226

AND GAME, RECORD OF FISH DISTRIBUTION—Continued

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Miscellaneous	Miscellaneous	Total
			129,320	56,135					
			459,560	224,120					1,108,275
			363,800	286,930					
			757,000	76,000					2,506,330
			105,000						148,000
			30,720						
			238,600						462,850
									25,000
				3,450					3,475
									68,000
									12,000
						172,018			921,564
			825,645	288,175					
			35,720						
			1,050,890						3,127,930
			10,500						
			105,000	51,060					
			71,850	158,602					744,793
			46,299	12,320					
					3,907,000				
			662,774	360,980	1,982,600				9,437,728
									25,000
				110,000					
			320,000						570,000
			10,000	110,000	280,440				1,118,985
			401,500	256,900					
19,220									1,144,220
			431,025	137,230					
				219,450					1,631,835
									57,500
208,070	1,000,871		10,778,223	5,403,398	6,653,891	290,518			41,113,714

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

SPINY RAYED

County	Source	Small Mouth Black Bass	Large Mouth Black Bass	Shad	Striped Bass
AMADOR	Central Valleys Fish Rescue				
BUTTE	Central Valleys Fish Rescue		5,500		
CALAVERAS	Central Valleys Fish Rescue	607	2,002		
FRESNO	Central Valleys Fish Rescue		27,143		
IMPERIAL	Southern California Fish Rescue		12		
KERN	Central Valleys Fish Rescue				
KINGS	Central Valleys Fish Rescue		508		
LAKE	Central Valleys Fish Rescue				
LOS ANGELES	Southern California Fish Rescue		6,360		
MADERA	Central Valleys Fish Rescue		2,615		
MERCED	Central Valleys Fish Rescue		85		
NAPA	Central Valleys Fish Rescue	22,065			
RIVERSIDE	Southern California Fish Rescue		16,550		
SACRAMENTO	Central Valleys Fish Rescue	2,043	570,341		360
SAN BERNARDINO	Southern California Fish Rescue		5,000		
SAN FRANCISCO	Central Valleys Fish Rescue		522		
SAN JOAQUIN	Central Valleys Fish Rescue		149,552		13,000
SANTA CRUZ	Fresno Holding Ponds				
SOLANO	Central Valleys Fish Rescue	6,245			1,200
STANISLAUS	Central Valleys Fish Rescue		2,119		
SUTTER	Central Valleys Fish Rescue		1,816	2,000	583
TEHAMA	Central Valleys Fish Rescue		112		
TULARE	Central Valleys Fish Rescue		123		
YOLO	Central Valleys Fish Rescue	854	1,401		14
NEVADA, STATE OF	Central Valleys Fish Rescue				
Totals		31,814	788,761	2,000	15,157

SPINY RAYED

Source	County	Small Mouth Black Bass	Large Mouth Black Bass	Shad	Striped Bass
CENTRAL VALLEYS FISH RESCUE	Amador				
	Butte		5,500		
	Calaveras	607	2,002		
	Fresno		24,143		
	Kern				
	Kings		508		
	Lake				
	Madera		2,615		
	Merced		85		
	Napa	22,065			
	Sacramento	2,043	570,341		360
	San Francisco		522		
	San Joaquin		149,552		13,000
	Solano	6,245			1,200
	Stanislaus		2,119		
	Sutter		1,816	2,000	583
	Tehama		112		
	Tulare		123		
	Yolo	850	1,401		14
	Nevada, State of				
FRESNO HOLDING PONDS	Santa Cruz				
SOUTHERN CALIFORNIA FISH RESCUE	Imperial		12		
	Los Angeles		6,360		
	Riverside		16,550		
	San Bernardino		5,000		
Totals		31,814	788,761	2,000	14,157

AND GAME, RECORD OF FISH DISTRIBUTION—Continued

FISH RESCUE

Mixed Sunfish	Sacramento Perch	Crappie	Squaretail Catfish	Forkedtail Catfish	Bluegill Sunfish	Green Sunfish	Warmouth Bass	Hardheads	Total
				512	20,200	10,090			30,802
		7,000	1,000		1,500				15,000
		1,000		110,000	369				122,978
	5	56,896	67,738	7,807	54,041	16,077			226,707
					12,000				12,012
		1,500	4,000	500	3,000	1,000			10,000
	30	14,285	1,060	1,471	18,700	7,947			44,001
			123,000						123,000
					7,640				14,000
		16,100	2,315	2,093	7,372	5,404			35,899
				250					335
				3,290	10,290	7,642			43,287
			5,050		21,500				43,100
	123	73,837	670,018	135,920	686,748	2,015,878	6,412	50	4,161,730
			800						5,800
30				12	12	12			588
		39,977	175,125	59,078	250,149	7,209	1,385		695,475
		4,000			6,000				10,000
	1			40,444	615	5,271			53,776
		1,245	40,253	2,350	51,135	350	153		97,605
		682		76,980	1,644				83,705
			50		57				219
		2,637	9,511	8,114	4,507	851			25,743
		421	7,314	125,037	21,613	28,124	119		184,897
				1,000		1,000			2,000
30	159	228,580	1,107,234	574,858	1,179,092	2,106,855	8,069	50	6,042,659

FISH RESCUE

Mixed Sunfish	Sacramento Perch	Crappie	Squaretail Catfish	Forkedtail Catfish	Bluegill Sunfish	Green Sunfish	Warmouth Bass	Hardheads	Total
				512	20,200	10,090			30,802
		7,000	1,000		1,500				15,000
		10,000		110,000	369				122,978
	5	56,896	67,738	7,807	54,041	16,077			226,707
		1,500	4,000	500	3,000	1,000			10,000
	30	14,285	1,060	1,471	18,700	7,947			44,001
			123,000						123,000
		16,100	2,315	2,093	7,372	5,404			35,899
				250					335
				3,290	10,290	7,642			43,287
	123	73,837	670,018	135,920	686,748	2,015,878	6,412	50	4,161,730
30				12	12	12			588
		39,977	175,125	59,078	250,149	7,209	1,385		695,475
	1			40,444	615	5,271			53,776
		1,245	40,253	2,350	51,135	350	153		97,605
		682		76,980	1,644				83,705
			50		57				219
		2,637	9,511	8,114	4,507	851			25,743
		421	7,314	125,037	21,613	28,124	119		184,897
				1,000		1,000			2,000
		4,000			6,000				10,000
					12,000				12,012
					7,640				140,000
			5,050		21,500				43,100
			800						5,800
30	158	228,580	1,107,234	574,858	1,179,092	2,106,855	8,069	50	6,042,569

DEPARTMENT OF NATURAL RESOURCES, DIVISION OF FISH

TROUT AND SAL

Source	County	Rainbow	Steelhead
CENTRAL VALLEYS	El Dorado	1,500	
PRAIRIE CREEK	Del Norte		66,245
	Humboldt		10,452
SOUTHERN CALIFORNIA	Orange		10,000
	San Bernardino	29,000	
	San Diego		9,800
	Santa Barbara		39,500
	Siskiyou		
UPPER EEL RIVER	Lake		232,903
	Mendocino		284,218
Totals		30,500	653,118

TROUT AND SAL

County	Source	Rainbow	Steelhead
DEL NORTE	Prairie Creek Hatchery		66,245
EL DORADO	Central Valleys Fish Rescue	1,500	
HUMBOLDT	Prairie Creek Hatchery		10,452
LAKE	Upper Eel River Fish Rescue		232,903
MENDOCINO	Upper Eel River Fish Rescue		284,218
ORANGE	Southern California Fish Rescue		10,000
SAN BERNARDINO	Southern California Fish Rescue	29,000	
SAN DIEGO	Southern California Fish Rescue		9,800
SANTA BARBARA	Southern California Fish Rescue		39,500
SISKIYOU	Southern California Fish Rescue		
Totals		30,500	653,118

SPINY RAYED FISH REARED AND PLANTED

County	Hatchery	Total from hatchery by county	Small Mouth Black Bass	Large Mouth Black Bass	Kentucky Bass	Striped Bass
BUTTE	Central Valleys	18,966	18,946		20	20
FRESNO	Central Valleys	20,317	20,317			
GLENN	Central Valleys	14,991	14,991			
KERN	Central Valleys	7,013	7,013			
LAKE	Central Valleys	400		400		
NEVADA, STATE OF	Central Valleys	1,095		295		
SACRAMENTO	Central Valleys	4,227	4,227			
STANISLAUS	Central Valleys	27,000	18,900		8,100	
Totals		94,009	84,374	695	8,120	20

AND GAME, RECORD OF FISH DISTRIBUTION—Continued

MON FISH RESCUE

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Miscellaneous	Miscellaneous	Total
									1,500
			2,320		10,544	77,015			156,124
		1			1,813	10,470			22,736
									10,000
									29,000
									9,800
									39,500
				800					800
									232,903
					8,277				292,495
		1	2,320	800	20,634	87,485			794,858

MON FISH RESCUE

Golden	Black Spotted	Cutthroat	Loch Leven	Eastern Brook	King Salmon	Silver Salmon	Miscellaneous	Miscellaneous	Total
			2,320		10,544	77,015			156,124
									1,500
		1			1,813	10,470			22,736
									232,903
					8,277				292,495
									10,000
									29,000
									9,800
									39,500
				800					800
		1	2,320	800	20,634	87,485			794,858

FROM CENTRAL VALLEY HATCHERY

Calico Bass	Sacramento Perch	Crappie	Squaretail Catfish	Forkedtail Catfish	Bluegill Sunfish	Green Sunfish	Blue Catfish	Miscellaneous	Total
									18,966
									20,317
									14,991
									7,013
									400
						300	500		1,095
									4,227
									27,000
						300	500		94,009

FINAL STATEMENT OF ANGLING LICENSE SALES, 1938 SERIES

County	Citizen $2 each	Nonresident $3 each	Alien $5 each	Duplicate 50c each	Total
Alameda	$58,990 00	$66 00	$1,115 00	$53 50	$60,224 50
Alpine	312 00	261 00		1 00	574 00
Amador	2,168 00			2 00	2,170 00
Butte	8,570 00	21 00	50 00	11 50	8,652 50
Calaveras	1,658 00			1 00	1,659 00
Colusa	1,454 00			3 00	1,457 00
Contra Costa	15,286 00	9 00	120 00	17 50	15,432 50
Del Norte	2,752 00	261 00	10 00	10 00	3,033 00
El Dorado	4,084 00	36 00	40 00	4 00	4,164 00
Fresno	19,462 00	9 00	360 00	19 00	19,850 00
Glenn	1,370 00			1 00	1,371 00
Humboldt	11,902 00	111 00	70 00	10 50	12,093 50
Imperial	1,550 00				1,550 00
Inyo	8,692 00	231 00	110 00	12 50	9,045 50
Kern	10,104 00	9 00	40 00	3 50	10,156 50
Kings	2,786 00		60 00	50	2,846 50
Lake	1,964 00			1 50	1,965 50
Lassen	3,028 00	9 00	20 00	3 00	3,060 00
Los Angeles	164,742 00	303 00	2,695 00	132 00	167,872 00
Madera	3,200 00	6 00	10 00	3 00	3,219 00
Marin	8,322 00		100 00		8,422 00
Mariposa	3,188 00	162 00	25 00	2 00	3,377 00
Mendocino	6,764 00		50 00	4 00	6,818 00
Merced	3,790 00	9 00		7 50	3,806 50
Modoc	1,840 00	75 00		2 00	1,917 00
Mono	4,700 00	216 00		5 00	4,921 00
Monterey	7,172 00	15 00	515 00	12 00	7,714 00
Napa	5,710 00		25 00	5 00	5,740 00
Nevada	5,596 00	1,071 00	110 00	14 50	6,791 50
Orange	14,008 00			3 50	14,011 50
Placer	6,372 00	63 00	30 00	1 00	6,466 00
Plumas	5,816 00	171 00	40 00	17 00	6,044 00
Riverside	7,290 00	3 00		5 50	7,298 50
Sacramento	24,466 00	225 00	2,700 00	110 50	27,501 50
San Benito	992 00		30 00	3 50	1,025 50
San Bernardino	15,456 00	24 00	5 00	6 00	15,491 00
San Diego	27,120 00	375 00	90 00	14 00	27,599 00
San Francisco	60,262 00	165 00	3,275 00	122 00	63,824 00
San Joaquin	20,002 00		775 00	16 50	20,793 50
San Luis Obispo	8,722 00			8 50	8,730 50
San Mateo	7,832 00		100 00	1 00	7,933 00
Santa Barbara	7,692 00		255 00	4 50	7,951 50
Santa Clara	17,010 00	6 00	540 00	16 50	17,572 50
Santa Cruz	7,564 00	15 00	390 00	16 00	7,985 00
Shasta	6,842 00	57 00	20 00	14 50	6,933 50
Sierra	1,144 00	3 00			1,147 00
Siskiyou	8,216 00	273 00	275 00	2 00	8,766 00
Solano	10,370 00		450 00	28 00	10,848 00
Sonoma	13,806 00	18 00	275 00	15 50	14,114 50
Stanislaus	8,170 00		30 00	12 00	8,212 00
Sutter	1,826 00		195 00	9 00	2,030 00
Tehama	2,560 00	6 00		3 50	2,569 50
Trinity	1,328 00	6 00			1,334 00
Tulare	9,226 00	63 00	50 00	4 00	9,343 00
Tuolumne	3,828 00	24 00	5 00	5 50	3,862 50
Ventura	6,582 00				6,582 00
Yolo	2,670 00			50	2,670 50
Yuba	3,908 00				3,908 00
State:					
Arizona					
Nevada		3,000 00			3,000 00
Oregon	118 00	42 00		50	160 50
Total angling	$682,354 00	$7,419 00	$15,055 00	$783 00	$705,611 00

FINAL STATEMENT OF HUNTING, DEER TAGS AND TRAPPING LICENSE SALES. 1938-1939 SERIES

County	Citizen	Junior	Hunting licenses				Total hunting
			Non-resident	Declarant alien	Alien	Duplicate	
	$2 each	$1 each	$10 each	$10 each	$25 each	50c each	
Alameda	$19,722 00	$824 00				$24 00	$20,570 00
Alpine	108 00	9 00	$120 00				237 00
Amador	2,116 00	179 00				3 50	2,298 50
Butte	9,780 00	653 00				18 50	10,451 50
Calaveras	2,078 00	100 00				1 50	2,179 50
Colusa	3,484 00	321 00	20 00		$25 00	9 00	3,859 00
Contra Costa	6,582 00	276 00		$50 00	25 00	7 50	6,940 50
Del Norte	946 00	77 00	10 00	20 00		2 50	1,055 50
El Dorado	2,676 00	125 00				1 50	2,802 50
Fresno	18,034 00	1,342 00	30 00	80 00	25 00	28 00	19,539 00
Glenn	3,382 00	350 00	60 00			11 50	3,803 50
Humboldt	9,014 00	467 00		120 00		8 00	9,609 00
Imperial	3,708 00	517 00					4,225 00
Inyo	2,832 00	156 00				9 50	2,997 50
Kern	15,666 00	897 00				11 50	16,574 50
Kings	3,756 00	214 00				50	3,970 50
Lake	3,292 00	268 00				5 50	3,565 50
Lassen	4,274 00	230 00	10 00	70 00		6 50	4,580 50
Los Angeles	88,596 00	3,102 00	240 00	240 00	125 00	114 50	92,417 50
Madera	2,426 00	144 00				6 00	2,576 00
Marin	3,586 00	251 00					3,837 00
Mariposa	812 00	39 00					851 00
Mendocino	6,788 00	423 00		10 00		3 50	7,224 50
Merced	5,218 00	468 00		40 00		12 00	5,738 00
Modoc	2,978 00	191 00	130 00			4 50	3,303 50
Mono	1,068 00	18 00	80 00				1,166 00
Monterey	8,072 00	540 00		230 00	125 00	24 00	8,991 00
Napa	4,774 00	439 00		10 00		14 50	5,237 50
Nevada	4,738 00	198 00	590 00	20 00		11 00	5,557 00
Orange	5,384 00	343 00				1 50	5,728 50
Placer	5,020 00	401 00			25 00	4 00	5,450 00
Plumas	3,508 00	171 00	30 00			6 50	3,715 50
Riverside	7,024 00	428 00				8 00	7,460 00
Sacramento	16,384 00	968 00	220 00	540 00	475 00	76 00	18,663 00
San Benito	2,062 00	215 00	10 00			6 00	2,293 00
San Bernardino	8,850 00	462 00				7 00	9,319 00
San Diego	14,080 00	791 00	10 00	10 00	50 00	19 50	14,960 50
San Francisco	25,760 00	609 00	250 00	930 00	575 00	78 00	28,202 00
San Joaquin	11,842 00	660 00		20 00	50 00	11 50	12,583 50
San Luis Obispo	7,450 00	592 00				15 00	8,057 00
San Mateo	4,322 00	350 00		40 00			4,712 00
Santa Barbara	6,106 00	495 00				9 50	6,610 50
Santa Clara	11,668 00	833 00		110 00	50 00	11 50	12,672 50
Santa Cruz	5,308 00	422 00	10 00	220 00	125 00	11 50	6,096 50
Shasta	5,840 00	226 00	50 00	10 00		11 00	6,137 00
Sierra	806 00	39 00				50	845 50
Siskiyou	9,248 00	483 00	1,700 00	190 00		8 50	11,629 50
Solano	5,456 00	320 00				6 50	5,782 50
Sonoma	10,328 00	738 00		90 00	100 00	12 50	11,268 50
Stanislaus	6,448 00	561 00				9 00	7,018 00
Sutter	2,216 00	198 00				7 50	2,421 50
Tehama	3,576 00	182 00	10 00			6 00	3,774 00
Trinity	1,204 00	40 00					1,244 00
Tulare	10,388 00	640 00				3 50	11,031 50
Tuolumne	2,506 00	114 00				5 00	2,625 00
Ventura	5,428 00	338 00				6 00	5,772 00
Yolo	4,788 00	407 00				5 50	5,200 50
Yuba	4,220 00	224 00				1 50	4,445 50
State:							
Arizona	12 00						12 00
Nevada			1,670 00				1,670 00
Oregon	1,154 00	17 00	3,020 00			4 00	4,195 00
Totals	$448,892 00	$25,085 00	$8,270 00	$3,050 00	$1,775 00	$691 50	$487,763 50

County	Deer tags 1938 series $1 each
Alameda	$6,264 00
Alpine	73 00
Amador	842 00
Butte	3,450 00
Calaveras	892 00
Colusa	1,133 00
Contra Costa	1,621 00
Del Norte	318 00
El Dorado	1,388 00
Fresno	4,695 00
Glenn	1,268 00
Humboldt	4,105 00
Imperial	296 00
Inyo	1,158 00
Kern	4,296 00
Kings	833 00
Lake	1,742 00
Lassen	2,027 00
Los Angeles	20,647 00
Madera	792 00
Marin	1,381 00
Mariposa	335 00
Mendocino	3,469 00
Merced	1,099 00
Modoc	1,564 00
Mono	382 00
Monterey	3,036 00
Napa	2,252 00
Nevada	2,107 00
Orange	1,419 00
Placer	1,865 00
Plumas	2,103 00
Riverside	1,681 00
Sacramento	4,435 00
San Benito	929 00
San Bernardino	2,362 00
San Diego	2,867 00
San Francisco	6,837 00
San Joaquin	2,941 00
San Luis Obispo	2,995 00
San Mateo	1,324 00
Santa Barbara	2,577 00
Santa Clara	4,125 00
Santa Cruz	1,928 00
Shasta	2,790 00
Sierra	421 00
Siskiyou	4,026 00
Solano	1,776 00
Sonoma	4,326 00
Stanislaus	1,609 00
Sutter	726 00
Tehama	1,592 00
Trinity	616 00
Tulare	3,151 00
Tuolumne	1,142 00
Ventura	2,163 00
Yolo	1,662 00
Yuba	1,306 00
State:	
Arizona	2 00
Nevada	169 00
Oregon	268 00
Total	$141,598 00

FINAL STATEMENT OF MISCELLANEOUS LICENSE SALES BY BRANCH OFFICES, 1938 SERIES

	Los Angeles	Monterey	Sacramento	San Diego	San Francisco	Terminal Island	Total
License year 7/1/38 to 6/30/39							
Commercial Hunting Club:							
Citizen, $25 each	$250 00		$250 00		$450 00		$950 00
Alien, $100 each							
Totals	$250 00		$250 00		$450 00		$950 00
Commercial hunting club operators:							
Citizen, $5 each	$80 00		$120 00		$160 00		$360 00
Alien, $25 each			25 00				25 00
Totals	$80 00		$145 00		$160 00		$385 00
Game tags, 3c each	$101 25		$7 02		$292 59		$400 86
License year 1/1/38 to 12/30/38							
Game breeders:							
$2.50 each	$750 00				$385 00		$1,135 00
License year 7/1/38 to 6/30/39							
Fish packer and shellfish dealer:							
Citizen, $5 each			$30 00	$60 00	$715 00	$250 00	$1,055 00
Alien, $20 each					100 00		100 00
Totals			$30 00	$60 00	$815 00	$250 00	$1,155 00
License year 1/1/38 to 12/30/38							
Fish importers:							
$5 each					$95 00		$95 00
License year 1/1/38 to 12/30/38							
Fish party boat:							
Permit, $1 each		$39 00		$33 00	$297 00	$199 00	$568 00
Fish breeder:							
$5 each					$365 00		$365 00
Year 1938							
Kelp:							
$10 each					$40 00		$40 00

* No sales from Fresno Branch.

Trapping, 1938-39 series $2,059 00

MISCELLANEOUS LICENSE SALES

	License year	Fee	Value
Market fisherman	License year, 4/1/38 to 3/30/39	$10 00	$78,110 00
Market fisherman	License year, 4/1/39 to 3/30/40	10 00	87,170 00
Trapping licenses	License year, 7/1/38 to 6/30/39	1 00 Cit. 2 00 Alien	2,059 00
Trapping licenses	License year, 7/1/39 to 6/30/40	1 00 Cit. 2 00 Alien	2,054 00
Fish packers and wholesale shellfish dealers	License year, 7/1/38 to 6/30/39	5 00 Cit. 10 00 Alien	1,155 00
Fish packers and wholesale shellfish dealers	License year, 7/1/39 to 6/30/40	5 00 Cit. 10 00 Alien	1,185 00
Game breeders	License year, 1/1/38 to 12/31/38	2 50	1,135 00
Game breeders	License year, 1/1/39 to 12/31/39	2 50	1,360 00
Fish breeders	License year, 1/1/38 to 12/31/38	5 00	365 00
Fish breeders	License year, 1/1/39 to 12/31/39	5 00	425 00
Domesticated fish importers licenses	License year, 1/1/38 to 12/31/38	5 00	95 00
Domesticated fish importers licenses	License year, 1/1/39 to 12/31/39	5 00	95 00
Kelp licenses	License year, 1938	10 00	4 00
Kelp licenses	License year, 1939	10 00	30 00
Commercial hunting gun club licenses	License year, 7/1/38 to 6/30/39	25 00 Cit. 100 00 Alien	950 00
Commercial hunting gun club licenses	License year, 7/1/39 to 6/30/40	25 00 Cit. 100 00 Alien	850 00
Commercial hunting club operators licenses	License year, 7/1/38 to 6/30/39	5 00 Cit. 25 00 Alien	385 00
Commercial hunting club operators licenses	License year, 7/1/39 to 6/30/40	5 00 Cit. 25 00 Alien	320 00
Fishing party vessel permit	License year, 1/1/38 to 12/31/38	1 00	568 00
Fishing party vessel permit	License year, 1/1/39 to 12/31/39	1 00	570 00

FINAL STATEMENT OF ANGLING LICENSE SALES, 1939 SERIES

County	Citizen, $2 each	Non-resident, $3 each	Alien, $5 each	Duplicate, 50c each	Total
Alameda	$57,386 00	$66 00	$1,435 00	$45 50	$58,932 50
Alpine	168 00	36 00		2 00	206 00
Amador	2,074 00	3 00	10 00	3 50	2,090 50
Butte	9,266 00	27 00	55 00	12 00	9,360 00
Calaveras	1,812 00	3 00	15 00	50	1,830 50
Colusa	1,394 00	3 00	5 00	2 50	1,404 50
Contra Costa	16,740 00	21 00	215 00	10 50	16,986 50
Del Norte	3,266 00	378 00	25 00	21 50	3,690 50
El Dorado	4,826 00	90 00	30 00	5 00	4,951 00
Fresno	21,676 00	60 00	500 00	29 50	22,265 50
Glenn	1,456 00	9 00	10 00	2 00	1,477 00
Humboldt	12,374 00	126 00	100 00	28 00	12,628 00
Imperial	1,926 00	132 00		1 00	2,059 00
Inyo	9,434 00	180 00	60 00	15 50	9,689 50
Kern	11,142 00	15 00	50 00	7 00	11,214 00
Kings	2,728 00		70 00		2,798 00
Lake	2,036 00	21 00	5 00	2 00	2,064 00
Lassen	3,258 00	21 00	30 00	5 00	3,314 00
Los Angeles	175,764 00	291 00	2,310 00	142 50	178,507 50
Madera	3,444 00	3 00	10 00	2 50	3,459 50
Marin	8,542 00	6 00	210 00	4 00	8,762 00
Mariposa	3,372 00	222 00	40 00		3,634 00
Mendocino	7,232 00	9 00	40 00	6 50	7,287 50
Merced	4,294 00	15 00	10 00	9 50	4,328 50
Monterey	7,398 00	3 00	600 00	5 50	8,006 50
Modoc	2,262 00	33 00	5 00	3 50	2,303 50
Mono	5,536 00	414 00	5 00	9 00	5,964 00
Napa	5,704 00	15 00	15 00	7 00	5,741 00
Nevada	5,702 00	1,236 00	75 00	11 50	7,024 50
Orange	15,160 00	12 00		3 50	15,175 50
Placer	5,910 00	42 00	10 00	1 50	5,963 50
Plumas	6,138 00	147 00	80 00	11 50	6,376 50
Riverside	8,320 00	3 00		4 00	8,327 00
Sacramento	26,510 00	183 00	2,860 00	93 50	29,646 50
San Benito	908 00		35 00	1 50	944 50
San Bernardino	990 00	60 00	5 00	14 50	18,069 50
San Diego	33,084 00	249 00	70 00	23 50	33,426 50
San Francisco	56,010 00	255 00	3,060 00	102 50	59,427 50
San Joaquin	21,158 00	12 00	915 00	15 50	22,100 50
San Luis Obispo	7,674 00	3 00	5 00	10 50	7,692 50
San Mateo	7,422 00		150 00	50	7,572 50
Santa Barbara	8,382 00	9 00	275 00	7 50	8,673 50
Santa Clara	16,318 00	15 00	560 00	16 00	16,909 00
Santa Cruz	7,350 00	27 00	370 00	17 50	7,764 50
Shasta	9,316 00	81 00	25 00	20 00	9,442 00
Sierra	1,270 00	6 00		1 00	1,277 00
Siskiyou	9,190 00	336 00	280 00	2 00	9,808 00
Solano	12,546 00	3 00	445 00	25 00	13,019 00
Sonoma	15,216 00	51 00	270 00	24 00	15,561 00
Stanislaus	9,806 00	18 00	95 00	17 00	9,936 00
Sutter	1,272 00		70 00	3 00	1,345 00
Tehama	2,654 00	9 00	5 00	4 50	2,672 50
Trinity	1,570 00	12 00	5 00	3 50	1,590 50
Tulare	9,410 00	60 00	55 00	2 50	9,527 50
Tuolumne	3,740 00			3 50	3,743 50
Ventura	6,872 00		5 00	2 00	6,879 00
Yolo	3,000 00		10 00	6 00	3,016 00
Yuba	4,012 00		25 00		4,037 00
State:					
Arizona					
Nevada	144 00	3,594 00		3 00	3,741 00
Oregon	192 00	225 00			417 00
Total angling	$720,756 00	$8,850 00	$15,620 00	$835 00	$746,061 00

FINAL STATEMENT OF HUNTING TAGS, 1939-40

County	Hunting licenses						
	Citizen	Junior	Non-resident	Declarant alien	Alien	Duplicate	Total hunting
	$2 each	$1 each	$10 each	$10 each	$25 each	50c each	
Alameda	$22,642 00	$917 00				$47 50	$23,606 50
Alpine	116 00	7 00	$70 00				193 00
Amador	2,396 00	144 00		$30 00		1 00	2,571 00
Butte	10,444 00	741 00				19 00	11,204 00
Calaveras	1,854 00	100 00		10 00		2 50	1,966 50
Colusa	3,676 00	291 00		10 00	$25 00	15 50	4,017 50
Contra Costa	7,760 00	379 00		40 00	25 00	11 00	8,215 00
Del Norte	868 00	80 00	30 00	10 00		5 50	993 50
El Dorado	3,168 00	117 00				3 00	3,288 00
Fresno	19,498 00	1,364 00		80 00	50 00	35 50	21,027 50
Glenn	3,732 00	338 00	10 00			21 00	4,101 00
Humboldt	8,986 00	450 00	50 00	60 00		13 50	9,559 50
Imperial	4,050 00	232 00		10 00		3 00	4,295 00
Inyo	2,866 00	178 00	10 00	10 00		8 00	3,072 00
Kern	16,324 00	890 00	20 00		25 00	22 50	17,281 50
Kings	3,998 00	236 00				2 50	4,236 50
Lake	3,336 00	297 00	10 00	10 00		4 00	3,657 00
Lassen	4,540 00	285 00	60 00	20 00		7 00	4,912 00
Los Angeles	95,810 00	3,346 00	190 00	150 00	125 00	149 50	99,770 50
Madera	2,682 00	133 00		20 00		5 00	2,840 00
Marin	3,946 00	310 00		20 00		5 00	4,281 00
Mariposa	970 00	56 00					1,026 00
Mendocino	7,238 00	475 00	10 00	10 00		14 50	7,747 50
Merced	5,604 00	506 00		30 00		13 00	6,153 00
Modoc	3,148 00	185 00	100 00	10 00		10 50	3,453 50
Mono	1,198 00	22 00	40 00			1 50	1,261 50
Monterey	8,246 00	551 00		140 00	125 00	18 50	9,080 50
Napa	5,078 00	443 00		20 00		9 00	5,550 00
Nevada	4,602 00	238 00	680 00	20 00		12 00	5,552 00
Orange	5,674 00	311 00	1,200 00			4 50	7,189 50
Placer	5,226 00	467 00		10 00		6 50	5,709 50
Plumas	4,092 00	181 00	60 00	10 00		9 00	4,352 00
Riverside	7,108 00	444 00				7 00	7,559 00
Sacramento	18,834 00	1,240 00	170 00	490 00	275 00	99 50	21,108 50
San Benito	2,188 00	220 00				5 50	2,413 50
San Bernardino	9,136 00	466 00				11 50	9,613 50
San Diego	13,970 00	706 00	40 00			26 00	14,742 00
San Francisco	26,550 00	663 00	300 00	970 00	650 00	87 00	29,220 00
San Joaquin	12,468 00	694 00		20 00	25 00	12 50	13,219 50
San Luis Obispo	6,456 00	537 00				16 50	7,009 50
San Mateo	5,502 00	367 00		90 00		50	5,959 50
Santa Barbara	6,786 00	549 00	50 00	10 00		14 50	7,409 50
Santa Clara	13,238 00	935 00		120 00	50 00	20 50	14,363 50
Santa Cruz	5,372 00	418 00		120 00	100 00	11 00	6,021 00
Shasta	8,328 00	301 00	10 00	10 00		19 50	8,668 50
Sierra	792 00	41 00				1 00	834 00
Siskiyou	10,902 00	656 00	3,030 00	130 00		22 00	14,740 00
Solano	6,072 00	400 00				12 00	6,484 00
Sonoma	11,020 00	817 00	30 00	100 00	50 00	16 00	12,033 00
Stanislaus	7,340 00	608 00		10 00		9 00	7,967 00
Sutter	2,040 00	196 00				7 00	2,243 00
Tehama	3,794 00	227 00	30 00			8 00	4,059 00
Trinity	1,348 00	52 00				1 50	1,401 50
Tulare	10,730 00	789 00				4 50	11,523 50
Tuolumne	2,588 00	161 00				4 50	2,753 50
Ventura	5,598 00	357 00				5 00	5,960 00
Yolo	5,362 00	453 00				17 50	5,832 50
Yuba	5,348 00	336 00				7 50	5,691 50
State:							
Arizona							
Nevada			1,550 00				1,550 00
Oregon	266 00	11 00	6,130 00			1 50	6,408 50
Totals	$482,904 00	$26,914 00	$13,880 00	$2,800 00	$1,525 00	$929 00	$528,952 00

County	Deer tags, 1939, $1 each
Alameda	$7,000 00
Alpine	72 00
Amador	945 00
Butte	3,596 00
Calaveras	846 00
Colusa	1,213 00
Contra Costa	2,532 00
Del Norte	260 00
El Dorado	1,502 00
Fresno	6,240 00
Glenn	1,292 00
Humboldt	3,827 00
Imperial	301 00
Inyo	1,207 00
Kern	3,419 00
Kings	898 00
Lake	1,855 00
Lassen	2,196 00
Los Angeles	20,616 00
Madera	874 00
Marin	1,635 00
Mariposa	495 00
Mendocino	3,757 00
Merced	1,299 00
Modoc	1,577 00
Mono	558 00
Monterey	3,235 00
Napa	2,481 00
Nevada	2,193 00
Orange	1,456 00
Placer	2,028 00
Plumas	2,104 00
Riverside	1,920 00
Sacramento	5,072 00
San Benito	1,002 00
San Bernardino	2,414 00
San Diego	3,078 00
San Francisco	7,458 00
San Joaquin	3,208 00
San Luis Obispo	2,825 00
San Mateo	1,582 00
Santa Barbara	2,646 00
Santa Clara	4,954 00
Santa Cruz	2,011 00
Shasta	3,695 00
Sierra	416 00
Siskiyou	4,484 00
Solano	2,063 00
Sonoma	4,861 00
Stanislaus	1,816 00
Sutter	586 00
Tehama	1,744 00
Trinity	697 00
Tulare	4,014 00
Tuolumne	586 00
Ventura	2,300 00
Yolo	1,820 00
Yuba	1,662 00
State:	
Arizona	
Nevada	156 00
Oregon	345 00
Total	$152,924 00

FINAL STATEMENT OF MISCELLANEOUS LICENSE SALES BY BRANCH OFFICES AND AGENTS, 1939 SERIES

	Fresno	Los Angeles	Monterey	Sacramento	San Diego	San Francisco	Terminal Island	Total
License year, 7/1/39 to 6/30/40								
Commercial hunting club:								
Citizen, $25 each		$250 00		$200 00		$400 00		$850 00
Alien, $100 each								
Totals		$250 00		$200 00		$400 00		$850 00
License year, 7/1/39 to 6/30/40								
Commercial hunting club operator:								
Citizen, $5 each		$70 00		$130 00		$95 00		$295 00
Alien, $25 each				25 00				25 00
Totals		$70 00		$155 00		$95 00		$320 00
License year, 1/1/39 to 12/30/39								
Game breeders, $2.50 each		$930 00		$17 50		$412 50		$1,360 00
License year, 7/1/39 to 6/30/40								
Fish Packer and shell fish dealer:								
Citizen, $5 each				$60 00	$70 00	$770 00	$245 00	$1,145 00
Alien, $20 each						40 00		40 00
Totals				$60 00	$70 00	$810 00	$245 00	$1,185 00
License year, 1/1/39 to 12/30/40								
Fish importers, $5 each						$95 00		$95 00
Fish party boat permit, $1 each			$29 00		$29 00	$297 00	$215 00	$570 00
Fish breeder, $5 each						$425 00		$425 00
License year, 1939								
Kelp, $10 each						$30 00		$30 00
License year, 4/1/39 to 3/30/40								
Market fisherman, $10 each						$871 70		

CALIFORNIA FRESH FISHERY PRODUCTS FOR YEAR 1938

Compiled by Division of Fish and Game, Bureau of Marine Fisheries

Species of fish	Del Norte, Humboldt	Mendocino, Sonoma, Lake	Marin	Solano, Yolo	Sacramento, San Joaquin	Alameda, Contra Costa	San Francisco, San Mateo	Santa Cruz	Monterey
Albacore	6,393	15,877					7,017	455,632	2,135,744
Anchovy		1,050					250,700		34,135
Barracuda									
Bonito								11	
Cabrilla									
Carp		5,350		58	7,182	24,395		1,381	
Catfish		29,048		76	144,919	137,852		50	
Corbina, Mexican									
Cultus	301,600	84,961	1,509				169,801	15,369	69,902
Eel									
Flounder	273,683	7,055	30			2,334	244,324	8,723	6,369
Flying fish									
Grouper									
Hake	965	775					18,015	15,975	375
Halibut, California		3,151	197				14,288	7,584	32,002
Halibut, Northern	398,608	6,858					290		35
Hardhead		3,125			9,766	55			
Herring	5,125	119	342,115			7,325	146,062		767
Kingfish							6,193	25,530	121,296
Mackerel, Horse									98,595
Mackerel, Pacific							1,013	807	1,481,451
Mackerel, Spanish									
Mullet									
Perch	8,909		39,744				29,532	415	15,333
Pike					325	660			
Pompano									
Rock Bass									14
Rockfish	341,721	213,833	7,713				543,373	532,856	1,319,755
Sablefish	202,225	15,144	455				8,052	31,119	7,361
Salmon	1,438,230	430,476		376,368	149,243	1,142,765	94,975	22,254	177,220
Sand Dab	210,517	23,683	1,237				352,234	31,178	14,291
Sardine		1,187					358,852,460	780	311,384,916
Sculpin									
Sea-bass, Black									
Sea-bass, Shortfin									

Sea-bass, White			800				10,271	17,893	5,970
Shad				14	23,354	1,315,354		5	
Shark	77,629	62,811	4,691			48,620	4,265,287	867,097	902,665
Sheepshead									
Skate	44,332	15,660	3,990				325,395	25,749	66,801
Skipjack									
Smelt	9,812	5,912	21,324			4,112	207,920	6,249	86,551
Sole	3,098,208	960,030	13,631				3,004,131	258,431	194,428
Split-tail		2,250			4,508	4,369			
Sucker					462				
Swordfish, Broadbill									
Tomcod	2,165						875		
Tuna, Bluefin									
Tuna, Yellowfin									
Turbot	935	270	1,040				74,765	2,153	6,722
Whitebait	65,834	31,849					6,390		2,516
Whitefish									
Yellowtail									
Miscellaneous Fish	62,193	23,766	1,035			10	74,338	4,047	4,904
Total fish	6,549,084	1,944,240	439,511	376,516	339,759	2,687,851	368,707,701	2,331,288	318,170,118
Crustaceans:									
Crab	521,684	21,988	3,132				3,149,818	107,388	60,582
Shrimp			253,169			139,278	1,451,629		3,285
Spiny Lobster									
Mollusks:									
Abalone									1,203,950
Clam, Hardshell		44	370					7	
Clam, Mixed	20,181	4,639	1,725						800
Clam, Pismo								1,047	13,063
Clam, Softshell	534	19	73,532			13,134			
Mussel								150	
Octopus	122	2,216	92				5,714	178	24,245
Oyster, Eastern and Japanese	29,600		1,069,714				357,399		8,000
Oyster, Native	145		32,016						
Squid									1,472,003
Totals	7,129,350	1,973,146	1,873,261	376,516	339,759	2,840,263	373,672,261	2,440,058	320,962,046

CALIFORNIA FRESH FISHERY PRODUCTS FOR YEAR 1938—Continued

Species of fish	San Luis Obispo, Santa Barbara, Ventura	Los Angeles	Orange	San Diego	Total taken in state waters and off coast of California	South of the International Boundary brought into Los Angeles	South of the International Boundary brought into San Diego	Total landings in California, including fish from west coast south of the International Boundary brought in by boat
Albacore	244,489	2,854,638	319,890	745,301	6,784,981		29,919	6,814,900
Anchovy		36,290	412,969		735,144			735,144
Barracuda	105,218	610,530	228,228	363,014	1,306,990	728,281	494,225	2,529,496
Bonito	26,772	2,728,399	242,171	1,687,217	4,684,570	2,651,925	503,498	7,839,993
Cabrilla						83,997	61,068	145,065
Carp		530			38,896			38,896
Catfish		14			311,959			311,959
Corbina, Mexican						721		721
Cultus	615	1,265		23	645,045			645,045
Eel		50	18		68			68
Flounder	294				542,812			542,812
Flying Fish		62,857			62,857			62,857
Grouper						21,527	46,431	67,958
Hake		298	25		36,428			36,428
Halibut, California	366,730	165,779	73,969	174,866	838,566	8,476	247,306	1,094,348
Halibut, Northern					405,791			405,791
Hardhead					12,946			12,946
Herring	42			3,329	504,884			504,884
Kingfish	416	330,133	8,965	642	493,175		14	493,189
Mackerel, Horse	399	3,953,377	277	81,270	4,133,918			4,133,918
Mackerel, Pacific	35,743	59,311,813	14,659,935	4,355,999	79,846,761	255	999	79,848,015
Mackerel, Spanish						7,038	5,256	12,294
Mullet		32	299	3,475	3,806			3,806
Perch	9,565	78,253	979	691	183,421			183,421
Pike					985			985
Pompano		543	88	572	1,203			1,203
Rock Bass	28,838	65,434	37,842	123,499	255,627	7,277	23,183	286,087
Rockfish	160,497	215,431	62,448	74,563	3,472,190	8,595	160,195	3,640,980
Sablefish	14	58,485	92,981		415,836			415,836
Salmon	183				3,831,714			3,831,714
Sand Dab	7	5,886	295		639,328			639,328
Sardine	1,116	256,801,987	3,056,054	5,512,903	935,611,403		86	935,611,489
Sculpin	851	90,341	2,935	61,153	155,280		106	155,386
Sea-bass, Black	13,648	12,038	5,335	3,827	34,848	217,822	154,879	407,549
Sea-bass, Shortfin				2,259	2,259			2,259

Sea-bass, White	93,634	82,981	9,586	48,852	269,987	47,616	309,044	626,647
Shad					1,338,727			1,338,727
Shark	1,019,984	115,040	86,429	51,237	7,501,490	1,364	10,687	7,513,541
Sheepshead	6,218	50,046	2,084	2,759	61,107	792	10,132	72,031
Skate	35,828	6,025	3,693	665	528,138		135	528,273
Skipjack		27	27	2,762	2,816	7,783,265	14,867,550	22,653,631
Smelt	41,453	176,194	2,518	4,819	566,864		939	567,803
Sole	204,706	1,581	2,438	63	7,737,647			7,737,647
Split-tail					11,127			11,127
Sucker					462			462
Swordfish, Broadbill	90,686	61,698	114,522	53,868	320,774	38,208	363,496	722,478
Tomcod					3,040			3,040
Tuna, Bluefin	9,820	14,528,478	3,426	1,970,538	16,512,262	527,371	688,398	17,728,031
Tuna, Yellowfin		3,323	103	7,140	10,566	19,513,408	58,560,018	78,083,992
Turbot		11			85,896			85,896
Whitebait					106,589			106,589
Whitefish	7,790	14,697	742	900	24,129	2,607	41,276	68,012
Yellowtail		44,788	11,246	190,625	246,659	2,288,471	4,277,188	6,812,318
Miscellaneous Fish	6,611	10,583	95,859	55	283,401	695	354	284,450
Total fish	2,512,167	342,479,875	19,538,376	15,528,886	1,081,605,372	33,939,711	80,856,382	1,196,401,465
Crustaceans:								
Crab	10	3,352	485		3,876,439			3,876,439
Shrimp					1,847,361			1,847,361
Spiny Lobster	109,860	107,186	36,174	55,176	308,396		889,595	1,197,991
Mollusks:								
Abalone	909,908	7,610			2,121,468			2,121,468
Clam, Hardshell		23,410			23,831			23,831
Clam, Mixed					27,345			27,345
Clam, Pismo	194,461				214,571			214,571
Clam, Softshell					87,219			87,219
Mussel					150			150
Octopus		47	18		32,632			32,632
Oyster, Eastern and Japanese	23,450				1,488,163			1,488,163
Oyster, Native					32,161			32,161
Squid		121,416	1,004	4,741	1,599,164		155	1,599,319
Totals	3,749,856	342,742,896	19,576,057	15,588,803	1,093,264,272	33,939,711	81,746,132	1,208,950,115

All amounts shown in pounds unless otherwise specified. 9,355 pounds Ratfish included with Sharks. 5,425 pounds Cabezone included with Rockfish.

NOTE.—This record does not include Albacore shipped in from Oregon and Washington, or fish imported from Japan or the Gulf of California.

This record is, as far as practicable, the catch made in or off the districts shown in the tables. Exceptions, 1,537,380 pounds Albacore landed by boat in Los Angeles District was taken off the Coast of Oregon and Washington. 457,721 pounds Albacore landed by boat in the San Diego District was taken off the Coast of Oregon. 37,919 pounds of fish landed in Del Norte, Humboldt District taken off the Coast of Oregon. 421 pounds Yellowtail and 240 pounds Broadbill Swordfish landed in Orange District taken off West Coast south of the International Boundary. 46,200 pounds Barracuda landed in San Luis Obispo, Santa Barbara, Ventura District taken off West Coast south of the International Boundary.

CANNED, CURED AND MANUFACTURED FISHERY PRODUCTS OF CALIFORNIA FOR THE YEAR OF 1938—SHORE PLANTS

Canned

Kind of fish or fishery product	Size of cans	San Francisco district, cases	Monterey district, cases	San Pedro district, cases	San Diego district, cases	Total cases
Albacore	4-lb., 12's			1,232	21	1,253
	1-lb.			22,719	1,276	23,995
	½-lb.			214,864	17,577	232,441
	¼-lb.			21,595	5,481	27,076
	¼-lb., 100's			4,519		4,519
	12-oz.			105		105
Bonito	1-lb.			21,822	11,995	33,817
	½-lb.			67,383	20,086	87,469
	¼-lb.				942	942
	¼-lb., 100's			2,625	1,001	3,626
Mackerel	1-lb.		5,159	828,284	44,856	878,299
	½-lb.			6,202	4,280	10,482
	½-lb., 96's		484	68,640	985	70,109
Sardine	No. 10, 6's		8,670			8,670
	1-lb. oval	164,559	556,477	600,532		1,321,568
	1-lb. tall	2,514	55,654	318,691		376,859
	½-lb. oval		4,827			4,827
	½-lb.			34,166		34,166
	½-lb., 96's	2,256	97,336	177,898		277,490
	¼-lb. square				19,056	19,056
	¼-lb., 100's		1,738			1,738
	5-oz., 100's	34,538	119,950	162,245		316,733
	9-oz. fillet		97,277			97,277
	6-oz. square		6			6
	6-oz., 96's		122			122
	10-oz.	5,751				5,751
Shad	1-lb.	7,655				7,655
Shad Roe	1-lb.	100				100
	½-lb.	3,589				3,589
	¼-lb.	313				313
Squid	9-oz.		17,527			17,527
	7-oz.		2,640			2,640
Swordfish	½-lb.	445				445
Tuna, bluefin	1-lb.			13,610	3,361	16,971
	½-lb.			219,702	42,784	262,486
	¼-lb.			21,638	3,695	25,333
	¼-lb., 100's			17,674		17,674
	12-oz.			734		734
Tuna, striped	4-lb., 12's			11		11
	1-lb.			10,363	10,274	20,637
	½-lb.			106,260	189,836	296,096
	¼-lb.			6,786	13,168	19,954
	¼-lb., 100's			27,435	8,639	36,074
	12-oz.			226		226
Tuna, yellowfin	4-lb., 12's			1,171	1,778	2,949
	1-lb.			25,298	68,540	93,838
	½-lb.			220,303	758,925	979,228
	¼-lb.			14,283	181,571	195,854
	¼-lb., 100's			10,490		10,490
	12-oz.			1,820		1,820
Tuna flakes	1-lb.			6,675	2,331	9,006
	½-lb.			40,417	14,925	55,342
	¼-lb.				128	128
Tuna, "tonno" style	½-lb.			8,193		8,193
	¼-lb., 100's			59,211		59,211
Yellowtail	1-lb.			4,772	12,697	17,469
	½-lb.			22,668	30,094	52,762
	¼-lb., 100's				1,003	1,003
Pet food	Misc. sizes	16,390		271,013		287,403
Totals		238,110	967,867	3,664,275	1,471,305	6,341,557

NOTE.—Forty-eight cans to the case unless otherwise specified. San Francisco District includes all area north of Monterey. San Pedro District includes Orange County.

Cured and Manufactured

Fishery products	Size or quantity	San Francisco district	Monterey district	San Pedro district	San Diego district	Total
Herring, smoked	Pounds	23,000				23,000
Mixed fish, dried	Pounds	51,474				51,474
Mixed fish, salted	Pounds			8,360	154,038	162,398
Sablefish, smoked	Pounds	221,475				221,475
Salmon, mild cure	825-lb. tierces	1,385				1,385
Salmon, smoked	Pounds	76,499				76,499
Sardine, salted	Pounds		22,900			22,900
Shad, mild cure	750-lb. tierces	39				39
Shrimp, dried	Pounds	96,634				96,634
Shrimp meal	Pounds	189,193				189,193
Fish meal	Tons	31,773	25,202	24,209	6,732	87,916
Fish oil	Gallons	7,032,792	4,753,160	2,126,661	130,606	14,043,219

Miscellaneous Data

Estimated value of pack		$4,414,034	$5,279,828	$15,548,478	$8,443,110	$33,685,450
Number of employees		1,566	2,588	3,817	2,146	10,117
Value of plants		$3,908,148	$3,255,001	$3,136,992	$945,737	$11,245,878

REPORT OF SARDINE CANNING AND REDUCTION PLANTS, SEASON, 1938-1939

Sardine fishing started in the Monterey District on August 2d and in the San Francisco District on August 9th, although deliveries were light in the Monterey District until the 15th, and during the entire month in the San Francisco District. The moon was full on the 11th of August. However, a few fish were brought into Monterey through the light of the moon period. In the San Pedro District fishing started on November 3d and deliveries were steady throughout the month with the exception of a few days during the full moon period which occurred on November 7th.

Sardines are used for two main purposes, canning and reduction. If the fish are to be packed or canned, the packer is not required to have a permit; but the law requires that a permit must be obtained from the commission if sardines are to be received for reduction purposes.

Sardines may be received for canning purposes during the season, without limit on the quantity, provided that not more than 32½ per cent of the amount of sardines received may be used in a reduction plant. The law provides that in determining percentage of sardines used for reduction purposes, it shall be deemed that a ton of sardines will produce 960 one-pound oval cans, or the equivalent, if other size cans are used. Nine hundred and sixty one-pound oval cans equals 20 cases, 48 cans to the case, and deducting the 32½ per cent which may be used for reduction purposes leaves a net requirement of not less than 13½ cases of one-pound oval cans, or the equivalent if other size cans are used, from each ton of sardines received for canning purposes.

During past seasons rather small quantities of sardines were received for canning purposes during the first month of the open season, particularly in the San Francisco and Monterey districts. However, this season showed a greater canning activity than usual, the fish apparently being in better condition for canning, although there was some complaint about the fish being of small size. The small fish were in evidence throughout the season, and had a tendency to curtail the pack to some extent. For canning, during the season, 16,552 tons were taken in the San Francisco District, 78,711 tons in the Monterey District and 92,594 tons in the San Pedro District, making a total of 187,857 tons received for canning purposes.

Permits to receive and use sardines by a reduction process for the manufacture of oil and meal were issued to all plants and were divided into three classifications as follows: Plants with an hourly rated press capacity of twenty tons or less were designated as Class I plants and for the season the total permit tonnage granted Class I plants was 7,000 tons made in three grants, starting with 5,000 tons, and two additional grants of 1,000 tons each were made. Plants with rated hourly press capacity of twenty-one to forty tons, designated as Class II, were grants of 1,000 tons each were made. Plants with rated hourly press additional grants of 1,000 tons each.

Plants with rated hourly press capacity of forty-one tons or over were designated as Class III plants and their original permits were for 10,000 tons, with two additional grants making a total of 13,000 tons for the season. In the Monterey and San Francisco districts the tonnage was granted on a monthly basis, between August and December and the tonnage granted for any month and not received could be received at any time up to the close of the season (February 15th). Floating plants that were outside of the jurisdiction of the State on August 1st were declared eligible for permits on their return, and their permits were to be adjusted so as to lose whatever tonnage they may have been entitled to during the time they were absent from California. During the season permits were issued for 348,042 tons in the Monterey and San Francisco districts and 284,376 tons were received. At the close of the season 63,666 tons of permit tonnage was canceled.

In the southern California districts permits were issued for 137,722 tons and at the close of the season 84,249 tons of permit tonnage was canceled. Total permit tonnage granted for the State was 485,764 tons and at the close of the season 147,915 tons granted were canceled. This report covers operations of the shore plants only and does not include sardines taken for fresh fish markets, bait, or quarter oil pack.

Six floating plants operated off the California coast starting the latter part of September and three of these ceased operations in October and the other three were in and tied up during the first part of December. The floating plants operated were: *American Fisher, Currier, Lake Miraflores, Lansing, Manatawny* and *Santa Inez*. It is estimated these floating plants received 57,212 tons of sardines and produced 9,535 tons of meal and 2,021,810 gallons of oil. Adding the estimated tonnage taken by the floating plants to the tonnage taken by the shore plants in the State would make 585,788 tons of sardines taken off the coast of California for the season.

The following shore plants operated during the season:

SAN FRANCISCO DISTRICT

Alaska Salmon Co., Richmond.
Benicia Fisheries (2 plants), Benicia.
F. E. Booth Co., Inc. (2 plants), Pittsburg.
Burnette and Parr (*Monitor*), Richmond.
California Fish Products Co., Richmond.
Carquinez Fishery, Ltd., Richmond.
Cypress Fisheries, Inc., San Francisco.
East Bay Fisheries, Inc., Richmond.
Edible Fish Meals & Oils, Inc., Richmond.
Farallone Packing Co., San Francisco.
Feed Products, Inc. (*Santa Inez*), Richmond.
Fish-Dee-Lish Corp., Richmond.
Fish Packers, Inc., McNears Point.
Fishermen's Produce Co., Inc. (*Lansing*), San Francisco.
Gardenia Packing Co. (*Brookdale*), Richmond.
Hofmann Packing Co., McNears Point.
Northern Packing Co., San Francisco.
Old Capitol Packers, Inc., McNears Point.

Ozol Packing Co., Martinez.
Pittsburg Canners, Inc., Richmond.
Point Edith Fisheries, Ltd., Port Chicago.
Polarine Fisheries, Inc. (*Polarine*), Richmond.
Red Rock Fisheries, Inc., Richmond.
Redondo Fish Products Co., Richmond.
Richmond Fisheries, Inc., Richmond.
San Pablo Fisheries, Richmond.
[1] Santa Cruz Oil Co. (*American Fisher*), San Francisco.
[1] Santa Cruz Oil Co. (*Lake Miraflores*), San Francisco.
Western Condensing Co. (Experimental), Richmond.

MONTEREY DISTRICT

F. E. Booth Co., Inc., Monterey.
California Packing Corp., Monterey.
Carmel Canning Co., Monterey.
Custom House Packing Corp., Monterey.
Del Mar Canning Co., Monterey.
E. B. Gross Canning Co. (2 plants), Monterey.
Hovden Food Products Corp. (2 plants), Monterey.
Hovden Food Products Corp. (2 plants), Moss Landing.
Monterey Canning Co., Monterey.
Monterey Fish Products, Inc., Monterey.
Monterey Fish Products, Inc., Seaside.
San Carlos Canning Co. (2 plants), Monterey.
San Xavier Fish Packing Co., Monterey.
Sea Pride Packing Corp., Ltd., Monterey.

SAN PEDRO DISTRICT

California Marine Curing & Packing Co., Terminal Island.
California Marine Products, Inc., Terminal Island.
[1] California Packing Corp., Terminal Island.
Coast Fishing Co., Wilmington.
Franco-Italian Packing Co., Terminal Island.
French Sardine Co. of California, Inc. (2 plants), Terminal Island
Italian Food Products Co., Long Beach.
K & M Fisheries, Inc., Terminal Island.
San Carlos Canning Co., Long Beach.
Sea Pride Packing Corp., Ltd., Terminal Island.
Sea Pride Packing Corp, Ltd., Wilmington.
South Coast Fisheries, Inc., Terminal Island.
Southern California Fish Corp., Terminal Island.
Van Camp Sea Food Co., Inc. (2 plants), Terminal Island.

SAN DIEGO DISTRICT

American Fisheries Co., San Diego.
Fishermen's Tuna Packing Co., San Diego.
Sun Harbor Packing Corp., San Diego.
Westgate Sea Products Co., San Diego.

[1] Permits issued, no sardines received.

PRODUCTION OF SARDINE PLANTS

August 1, 1938, to March 31, 1939

District	Sardines received, tons	Used for canning, tons	Cannery fish overage used for meal and oil, tons	Used for meal and oil under permit, tons
San Francisco	200,361	11,205	5,347	183,039
Monterey	180,040	53,165	25,546	101,337
San Pedro	145,335	64,318	28,276	50,683
San Diego	2,790	.....	.....	2,790
Totals	528,576	[1]128,688	59,169	337,849
Add cannery overage used for meal and oil	.....	59,169	.....	.....
Total tons received for canning purposes	.....	187,857	.....	.....

[1] The law requires that 13½ cases of 1-lb. oval cans be canned from each ton of sardines received for canning purposes, but in figuring amount actually used in canning, a basis of 20 cases per ton is used.

District	Cannery offal, tons	1-lb. ovals packed, cases	Other size cans packed, cases	Other size cans reduced to equivalent of 1-lb. ovals, cases	Cases per ton
San Francisco	5,602	172,454	60,354	51,658	13.5
Monterey	26,583	687,287	412,872	376,076	13.5
San Pedro	32,161	630,998	681,597	655,303	13.9
San Diego	.....	.....	.....	.....	.....
Totals	64,346	1,490,739	1,154,823	1,083,037	.....

District	Sardine meal, tons	Ratio per ton of meal	Sardine oil, gallons	Gallons of oil per ton of fish and offal
San Francisco	34,751	5.6	7,804,909	40.2
Monterey	28,859	5.3	5,462,066	35.6
San Pedro	22,066	5.0	2,197,757	19.8
San Diego	537	5.2	37,325	13.4
Totals	86,213	.....	15,502,057	.....

District	Permits issued, tons	Unused permit tonnage cancelled, tons	Used for other purposes, tons
San Francisco	214,812	31,773	[2]770
Monterey	133,230	31,893	[3]42
San Pedro	109,778	59,095	[4]2,058
San Diego	27,944	25,154	.....
Totals	485,764	147,915	2,870

[2] 770 tons pet food.
[3] 42 tons for salting.
[4] 2,018 tons pet food, 40 tons for salting.

COMPARATIVE STATEMENT OF SARDINE PLANT OPERATIONS, SEASONS 1937-38 AND 1938-39

San Francisco District

	Season 1937-38	Season 1938-39	Increase
Tons of sardines received for canning	11,883	16,552	4,669
Tons of sardines received under permit for meal and oil	120,365	183,039	62,674
Tons of sardines received for pet food, etc.		770	770
Total tons of sardines received for all purposes	132,248	200,361	68,113
Cases of 1-lb. oval cans packed	127,214	172,454	45,240
Cases of other size cans packed	35,842	60,354	24,512
Other size cans reduced to equivalent cases of 1-lb. ovals	33,763	51,658	17,895
Meal, tons	23,058	34,751	11,693
Oil, gallons	4,659,147	7,804,909	3,145,762

Monterey District

	Season 1937-38	Season 1938-39	Increase
Tons of sardines received for canning	60,868	78,711	17,843
Tons of sardines received under permit for meal and oil	43,570	101,337	57,767
Tons of sardines received for salting, etc.	26	42	16
Total tons of sardines received for all purposes	104,464	180,090	75,626
Cases of 1-lb. oval cans packed	502,194	687,287	185,093
Cases of other size cans packed	347,724	412,872	65,148
Other size cans reduced to equivalent cases of 1-lb. ovals	326,543	376,076	49,533
Meal, tons	15,383	28,859	13,476
Oil, gallons	3,067,587	5,462,066	2,394,479

San Pedro District

	Season 1937-38	Season 1938-39	Increase
Tons of sardines received for canning	88,120	92,594	4,474
Tons of sardines received under permit for meal and oil	19,873	50,683	30,810
Tons of sardines received for pet food, etc.	1,022	2,058	1,036
Total tons of sardines received for all purposes	109,015	145,335	36,320
Cases of 1-lb. oval cans packed	553,306	630,998	77,692
Cases of other size cans packed	747,482	681,597	*65,885
Other size cans reduced to equivalent cases of 1-lb. ovals	756,369	655,303	*101,066
Meal, tons	14,525	22,066	7,541
Oil, gallons	1,447,631	2,197,757	750,126

*Decrease.

San Diego District

	Season 1937-38	Season 1938-39	Increase
Tons of sardines received for canning purposes	57		*57
Tons of sardines received under permit for meal and oil	50	2,790	2,740
Total tons of sardines received for all purposes	107	2,790	2,683
Cases of 1-lb. oval cans packed			
Cases of other size cans packed	1,013		*1,013
Other size cans reduced to equivalent cases of 1-lb. ovals	1,040		*1,040
Meal, tons	15	537	522
Oil, gallons	912	37,325	36,413

*Decrease.

All Districts Combined (Shore Plants)

	Season 1937-38	Season 1938-39	Increase
Tons of sardines received for canning	160,928	187,857	26,929
Tons of sardines received under permit for meal and oil	183,858	337,849	153,991
Tons of sardines received for salting, pet food, etc.	1,048	2,870	1,822
Total tons of sardines received for all purposes	345,834	528,576	182,742
Cases of 1-lb. oval cans packed	1,182,714	1,490,739	308,025
Cases of other size cans packed	1,132,061	1,154,823	22,762
Other size cans reduced to equivalent cases of 1-lb. ovals	1,117,715	1,083,037	*34,768
Meal, tons	52,981	86,213	33,232
Oil, gallons	9,175,277	15,502,057	6,326,780

*Decrease.

SARDINE CATCH, BY MONTHS, SEASON 1938-39

Month	San Francisco			Monterey		
	Canning	Reduction	Other purposes	Canning	Reduction	Other purposes
August, 1938	422	2,848		8,207	15,458	5
September	2,651	39,203		11,292	17,491	
October	2,071	23,750		11,511	17,562	17
November	3,124	23,871	300	12,765	18,985	11
December	3,598	56,108	392	13,901	18,145	
January, 1939	4,686	37,259	78	21,035	13,696	9
February						
Totals	16,552	183,039	[a]770	78,711	101,337	[b]42

[a] 770 tons for pet food.
[b] 42 tons for salting.

Month	San Pedro			San Diego		
	Canning	Reduction	Other purposes	Canning	Reduction	Other purposes
November, 1938	20,861	13,796	402		2,430	
December	15,497	22,077	453		47	
January, 1939	16,304	7,466	325		19	
February	25,904	4,952	371		156	
March	14,028	2,392	507		138	
Totals	92,594	50,683	[c]2,058		2,790	

[c] 2,018 tons for pet food, 40 tons for salting.

PACK OF 1-LB. OVALS BY MONTHS, SEASON 1938-39

Month	San Francisco, cases	Monterey, cases	San Pedro, cases	San Diego, cases
August, 1938	3,694	67,566		
September	26,209	87,828		
October	20,392	96,677		
November	35,288	108,781	142,456	
December	38,150	126,077	106,785	
January, 1939	48,721	200,358	107,312	
February			180,318	
March			94,127	
Totals	172,454	687,287	630,998	

PACK OF OTHER SIZE CANS REDUCED TO EQUIVALENTS OF 1-LB. OVALS, BY MONTHS, SEASON 1938-39

Month	San Francisco, cases	Monterey, cases	San Pedro, cases	San Diego, cases
August, 1938	1,951	43,385		
September	9,741	64,749		
October	7,576	58,869		
November	7,396	63,657	139,201	
December	10,437	61,645	102,546	
January, 1939	14,557	83,771	113,742	
February			185,154	
March			114,660	
Totals	51,658	376,076	655,303	

SARDINE MEAL PRODUCTION BY MONTHS, SEASON 1938-39

Month	San Francisco, tons	Monterey, tons	San Pedro, tons	San Diego, tons
August, 1938	496	3,713		
September	6,562	4,451		
October	4,426	4,667		
November	4,803	5,192	5,330	412
December	10,753	5,380	6,508	65
January, 1939	7,711	5,456	3,573	5
February			4,237	31
March			2,418	24
Totals	34,751	28,859	22,066	537

SARDINE OIL PRODUCTION BY MONTHS, SEASON 1938-39

Month	San Francisco, gallons	Monterey, gallons	San Pedro, gallons	San Diego, gallons
August, 1938	111,627	746,004		
September	1,708,562	923,127		
October	1,001,812	970,778		
November	1,080,914	975,035	706,917	33,890
December	2,385,541	915,347	669,530	520
January, 1939	1,426,453	931,775	263,839	90
February			425,064	1,600
March			132,407	1,225
Totals	7,804,909	5,462,066	2,197,757	37,325

CALIFORNIA FRESH FISHERY PRODUCTS FOR YEAR 1939

Compiled by Division of Fish and Game, Bureau of Marine Fisheries

Species of fish	Del Norte, Humboldt	Mendocino, Sonoma, Lake	Marin	Solano, Yolo	Sacramento, San Joaquin	Alameda, Contra Costa	San Francisco, San Mateo	Santa Cruz	Monterey
Albacore	1,318	1,604					238,771	963,566	3,565,238
Anchovy							214,907		11,970
Barracuda									
Bonito								11	17
Cabrilla									
Carp				1,711	2,966	9,385			
Catfish		31,205			124,462	61,153			
Cultus	170,350	143,030					190,843	26,141	41,156
Flounder	236,581	6,831				6,738	470,509	7,139	9,156
Flying fish									
Grouper									
Hake	3,410	460					9,641	150	
Halibut, California		1,725	301				24,960	3,226	25,661
Halibut, Northern	351,613	26,158					21		
Hardhead					12,921				
Herring	14,475		76,625			12,725	189,049		1,175
Kingfish							5,386	35,103	153,929
Mackerel, Horse								550	81,945
Mackerel, Pacific	18						95	918	827,515
Mackerel, Spanish									
Mullet									
Perch	4,863	12	35,363				22,632	732	25,201
Pike				55	46	82			
Pompano								14	187
Rock Bass									
Rockfish	473,495	282,609	348				386,809	282,053	1,050,053
Sablefish	364,433	231,260					14,757	5,123	28,795
Salmon	1,553,321	268,789		115,954	144,393	237,047	285,194	35,029	90,469
Sand Dab	185,342	46,113					500,539	50,141	33,884
Sardine							491,842,739	86,910	429,512,577
Sculpin									
Sea Bass, Black									245
Sea Bass, Shortfin									
Sea Bass, White			409				14,993	92,278	11,511
Sea Trout, California	11							13	

Shad				178,593	68,636	1,069,066	470	3	
Shark	15,759	22,713	1,718			43,131	4,519,229	599,674	1,224,208
Sheepshead									
Skate	50,310	8,340				75	204,523	11,551	19,184
Skipjack									
Smelt	7,062	18,996	16,745			6,751	144,494	9,277	89,954
Sole	2,701,150	1,588,808					4,056,216	265,832	908,700
Splittail					1,000	14,461			
Sucker					53				
Swordfish, Broadbill									
Tom Cod	3,805					320	550		
Tuna, Bluefin							4,715		
Tuna, Yellowfin									
Turbot		420	1,762				97,701	1,236	3,466
Whitebait	86,264	55,868				7	19,598		4,398
Whitefish									
Yellowtail									
Miscellaneous	74,149	37,476	50				72,314	4,288	1,898
Total fish	6,297,729	2,772,417	133,321	296,313	354,477	1,460,941	503,531,655	2,480,958	437,722,492
Crustaceans:									
Crab	2,004,737	7,088				74,784	3,478,668	242,726	135,410
Shrimp			235,494			64,260	876,225		4,271
Spiny Lobster									
Mollusks:									
Abalone									789,450
Clam, Hardshell	2	4	283						
Clam, Mixed	17,736	5,632	1,880						36
Clam, Pismo								828	15,502
Clam, Softshell	534		56,444			18,743			
Mussel	1,800								
Octopus	4	2,534	30				2,977	681	22,574
Oysters, Eastern and Japanese	6,522		1,693,194				10,086		
Oyster, Native	1,905		11,846						
Squid									1,097,815
Scallops	300								
Totals	8,331,269	2,787,675	2,132,492	296,313	354,477	1,618,728	507,899,611	2,725,193	439,787,550

CALIFORNIA FRESH FISHERY PRODUCTS FOR YEAR 1939—Continued

Species of fish	San Luis Obispo, Santa Barbara, Ventura	Los Angeles	Orange	San Diego	Total taken in state waters and off the coast of California	South of the International Boundary brought into Los Angeles	South of the International Boundary brought into San Diego	Total landings in California, including fish from west coast south of the International Boundary brought in by boat
Albacore	1,561,709	2,485,747	412,617	541,925	9,772,495	500	3,687	9,776,682
Anchovy		983,163	937,861		2,147,901			2,147,901
Barracuda	180,499	1,518,167	421,439	958,608	3,078,713	476,528	534,736	4,089,977
Bonito	37,572	5,758,800	19,917	880,898	6,697,215	2,981,370	240,256	9,918,841
Cabrilla						88,579	22,758	111,337
Carp					14,062			14,062
Catfish		22			216,842			216,842
Cultus	931	1,557		116	574,124	173	429	574,726
Flounder	2,264			93	739,311			739,311
Flying fish	81	20,126		114	20,321			20,321
Grouper						20,940	20,490	41,430
Hake					13,661			13,661
Halibut, California	330,333	182,923	127,873	49,495	746,497	21,441	248,096	1,016,034
Halibut, Northern	33				377,825			377,825
Hardhead					12,921			12,921
Herring	1,456			6,737	302,242			302,242
Kingfish	539	320,635	26,584	650	542,826		75	542,901
Mackerel, Horse		3,675,875	505	1,280	3,760,155			3,760,155
Mackerel, Pacific	30,083	51,874,627	21,779,407	6,395,806	80,908,469		382	80,908,851
Mackerel, Spanish						12,570	3,471	16,041
Mullet			97	2,921	3,018			3,018
Perch	20,366	30,414	359	245	140,187			140,187
Pike					183			183
Pompano		2,635	568		3,404			3,404
Rock Bass	39,401	64,780	36,700	97,386	238,267	7,162	20,568	265,997
Rockfish	201,268	263,895	46,580	202,843	3,189,953	45,293	99,393	3,334,639
Sablefish	23	71,987	50,666		767,044			767,044
Salmon					2,730,196			2,730,196
Sand Dab	7	4,324	854		821,204			821,204
Sardine	3,625	235,982,628	2,533,463	831,639	1,160,793,581			1,160,793,581
Sculpin	402	82,626	6,182	39,290	128,500		128	128,628
Sea Bass, Black	13,373	4,400	9,982	4,281	32,281	197,191	230,470	459,942
Sea Bass, Shortfin				2,600	2,600			2,600
Sea Bass, White	221,874	300,383	30,952	131,403	803,803	1,169	186,623	991,595
Sea Trout, California					24			24

Shad					1,316,768			1,316,768
Shark	2,490,123	61,073	147,181	31,845	9,156,654	1,249	2,346	9,160,249
Sheepshead	24,849	27,129	1,998	4,408	58,384	694	12,268	71,346
Skate	31,564	4,703	6,604		336,854			336,854
Skipjack	10	62,946	111,241	2,544,400	2,718,597	13,015,614	14,386,636	30,120,847
Smelt	24,657	148,005	965	7,181	474,087		599	474,686
Sole	216,694	1,890	3,643	1,859	9,744,792			9,744,792
Splittail					15,461			15,461
Sucker					53			53
Swordfish, Broadbill	75,080	84,038	110,869	58,643	328,630	65,819	199,911	594,360
Tom Cod					4,675			4,675
Tuna, Bluefin	9,727	7,910,819	739	1,391,859	9,317,859	2,456,976	59,761	11,834,596
Tuna, Yellowfin	75	11,427	28,610	417,293	457,405	36,110,675	73,849,721	110,417,801
Turbot					104,585			104,585
Whitebait					166,135			166,135
Whitefish	13,516	5,464	2,315	2,986	24,281	2,865	16,542	43,688
Yellowtail		100,215	1,966	159,250	261,431	907,978	1,695,786	2,865,195
Miscellaneous	10,201	34,621	35,008	1,047	271,052	224	528	271,804
Total fish	5,542,335	312,082,044	26,893,745	14,769,101	1,314,337,528	56,415,010	91,835,660	1,462,588,198
Crustaceans:								
Crab		3,809	175		5,947,397			5,947,397
Shrimp					1,180,250			1,180,250
Spiny Lobster	122,238	145,152	25,433	83,974	376,797	13,810	899,158	1,289,765
Mollusks:								
Abalone	1,003,237	3,053			1,795,740			1,795,740
Clam, Hardshell	20	20,598			20,907			20,907
Clam, Mixed					25,284			25,284
Clam, Pismo	175,653				191,983			191,983
Clam, Softshell					75,721			75,721
Mussel					1,800			1,800
Octopus	167	130	419		29,516			29,516
Oyster, Eastern and Japanese	19,342				1,729,144			1,729,144
Oyster, Native					13,751			13,751
Squid		62,451	335	1,455	1,162,056			1,162,056
Scallops					300			300
Totals	6,862,992	312,317,237	26,920,107	14,854,530	1,326,888,174	56,428,820	92,734,818	1,476,051,812

All amounts shown in pounds unless otherwise specified.

NOTE: This record does not include albacore shipped in from Oregon and Washington, or fish imported from Japan, or the Gulf of California. This record is, as far as practicable, the catch made in or off the districts shown in the tables. Exceptions: Del Norte-Humboldt district, 92,066 pounds of fish of different varieties originated in waters off the coast of Oregon. Los Angeles district, 1,296,023 pounds of albacore originated in waters off the coast of Oregon and Washington. San Diego district, 436,043 pounds of albacore originated in waters off the coast of Oregon and Washington. San Luis Obispo, Santa Barbara, Ventura district, 111,540 pounds of barracuda and 200 pounds of sea bass, black, originated in waters south of the International Boundary.

CANNED, CURED AND MANUFACTURED FISHERY PRODUCTS OF CALIFORNIA FOR THE YEAR OF 1939

Canned

Kind of fish or fishery product	Size of cans	San Francisco district, cases	Monterey district, cases	San Pedro district, cases	San Diego district, cases	Total cases
Albacore	4-lb., 12's			2,888		2,888
	1-lb.			28,505	1,120	29,625
	½-lb.		28,637	235,968	44,691	309,296
	¼-lb.			5,506	561	6,067
	¼-lb., 100's			8,799		8,799
Bonito	1-lb.			33,456	3,731	37,187
	½-lb.			99,830	15,857	115,687
	¼-lb., 100's			6,216		6,216
Mackerel	1-lb.		2,604	869,474	73,608	945,686
	½-lb.			2,106	494	2,600
	½-lb., 96's			19,270	973	20,243
Roe	1-lb.				189	189
Sardine	No. 10 cans, 6's		13,660	1,520		15,180
	1-lb., tall	40,092	270,076	308,896	81	619,145
	1-lb., oval	225,462	1,023,285	627,524		1,876,271
	10-oz.	12,350				12,350
	½-lb., oval		8,129			8,129
	½-lb.		11,291	37,580		48,871
	½-lb., 96's	7,223	97,625	179,520		284,368
	½-lb., fillet		141,900			141,900
	½-lb., B & P		983			983
	¼-lb., sq.				148	148
	¼-lb., 100's B & P		2,528			2,528
	5-oz., 100's	36,666	101,551	178,072		316,289
Shad	1-lb.	9,193				9,193
Shad Roe	1-lb.	150				150
	½-lb.	3,472				3,472
Squid	9-oz.		21,902			21,902
	7-oz.		2,024			2,024
Tuna, bluefin	1-lb.			16,672	1,900	18,572
	½-lb.			145,325	24,602	169,927
	¼-lb.			14,507	518	15,025
	¼-lb., 100's			14,952		14,952
Tuna, striped	1-lb.			9,216	12,771	21,987
	½-lb.			157,394	198,895	356,289
	¼-lb.			12,101	13,039	25,140
	¼-lb., 100's			33,331	32,823	66,154
Tuna, yellowfin	4-lb., 12's			1,780	1,315	3,095
	1-lb.			45,111	75,949	121,060
	½-lb.			452,841	1,089,633	1,542,474
	¼-lb.			40,114	181,350	221,464
	¼-lb., 100's			37,414	318	37,732
	12-oz.			1,467		1,467
Tuna flakes	4-lb., 12's				150	150
	1-lb.			5,718	2,242	7,960
	½-lb.			35,386	28,618	64,004
	¼-lb.				126	126
Tuna, "tonno" style	½-lb.			8,400	1,719	10,119
	¼-lb., 100's			61,622	5,599	67,221
Yellowtail	1-lb.			2,137	4,445	6,582
	½-lb.			9,602	8,430	18,032
Pet food	Misc. sizes	13,138		370,120	1,169	384,427
Totals		347,746	1,726,195	4,120,340	1,827,064	8,021,345

NOTE.—Forty-eight cans to the case unless otherwise specified. San Francisco District includes all area north of Monterey. San Pedro District includes Orange County.

Cured and Manufactured

Fishery product	Size or quantity	San Francisco district	Monterey district	San Pedro district	San Diego district	Total
Mixed fish, dried	Pounds	55,054				55,054
Mixed fish, salted	Pounds				202,734	202,734
Sablefish, smoked	Pounds	256,513				256,513
Salmon, mild cure	825-lb. tierces	515				515
Salmon, smoked	Pounds	111,935				111,935
Sardines, salted	Pounds		7,625			7,625
Shad, mild cure	750-lb. tierces	21				21
Shrimp, dried	Pounds	70,378				70,378
Shrimp meal	Pounds	136,969				136,969
Fish meal	Tons	43,369	33,238	21,858	6,704	105,169
Fish oil	Gallons	10,395,398	6,894,201	1,594,122	96,806	18,980,527

Miscellaneous Data

Estimated value of pack		$6,752,034	$9,137,719	$18,127,722	$10,759,689	$44,777,164
Number of employees		1,660	2,740	3,478	1,946	9,824
Value of plants		$4,369,561	$3,179,578	$2,887,371	$952,399	$11,388,909

REPORT OF SARDINE CANNING AND REDUCTION PLANTS, SEASON 1939-1940

Sardine fishing started in the Monterey district on the night of September 12 and the first deliveries were made on the 13th. In the San Francisco district fishing did not start until the night of October 9 and deliveries made on the morning of the 10th were very heavy, for a number of the fishing boats did not unload their catches until the following day. In the San Pedro district deliveries were made on November 1 and in the San Diego district only ninety-five tons of sardines were delivered during the season.

Sardines are used for two main purposes, that is canning and manufacture of oil and meal by a reduction process. To engage in the manufacture of oil and meal by a reduction process, it is necessary to obtain a permit from the Commission. Sardines may be received for canning purposes without limit on the tonnage provided that not more than 32½ per cent of the amount received for canning may be used by a reduction process. This overage is provided by law to permit the discard of soft, broken, and off-size fish which are not fit to pack. There has been no change in the law since the 1938-39 season, and the method of determining the percentage of sardines received for canning that may be used for reduction purposes has not changed from that shown in Circular 13.[1]

There was an increase in the sardine pack, principally in the San Francisco and Monterey districts and there would have been an increase in the San Pedro district if sardines had been available and of a size and condition fit for canning.

For canning purposes, 16,552 tons were received in the San Francisco district, 130,518 tons in the Monterey district, 73,634 tons in the San Pedro district and 4 tons in the San Diego district—a total of 225,357 tons as compared with 187,857 tons received for canning purposes during the previous season.

Permits to receive and use sardines by a reduction process were issued in three classifications, based on the press capacity. Plants with an hourly capacity of one to twenty tons were designated as Class I plants of which the fifty-one in the State were given 5,000 ton permits for the season. The plants with an hourly capacity of twenty-one to forty tons were designated as Class II plants and the twelve plants in this classification were given permits for 7,500 tons for the season. The six plants with an hourly capacity of forty-one tons or more were designated as Class III plants and given permits for 10,000 tons for the season.

The permits for the San Francisco and Monterey districts were issued on a monthly allotment basis, starting with ten per cent of the permit in August, fifteen per cent in September, twenty per

[1] Circular 13, "Statistical Report of Fresh and Canned Fishery Products, Year 1938. Sardine Canning and Reduction Plants Report Season 1938-1939."

cent in October, twenty-five per cent in November, and thirty per cent in December. All tonnage not received during the month for which it was allotted could be accumulated and taken any time up to the close of the season February 15.

No additional grants to receive sardines under permit were made after the season opened.

Permits were issued for 402,375 tons, but only 303,426 tons were received, leaving an unused permit tonnage of 99,005 tons. By referring to the tables following, it will be noted that most of the canceled permit tonnage was in the San Pedro and San Diego districts, where there was a scarcity of sardines, and a great demand for sardines for canning purposes. The oil production in southern California was very low and only such fish as were unfit for canning were used by a reduction process.

This report does not include sardines taken for fresh fish markets, bait, or quarter oil pack.

No floating plants were operated off the California coast during the season.

The following plants operated during the season:

SAN FRANCISCO DISTRICT

Alaska Salmon Co., Richmond
Benicia Fisheries,[1] (2 plants), Benicia
F. E. Booth Co., Inc. (2 plants), Pittsburg
Burnett and Parr (*Currier*), Richmond
Burnett and Parr (*Monitor*), Richmond
California Fish Products Co., Richmond
Carquinez Fishery, Ltd., Richmond
Cypress Fisheries, Inc., San Francisco
Deep Sea Fisheries, Inc., (*Manatawny*), Richmond
East Bay Fisheries, Inc., Richmond
Edible Fish Meals & Oils, Inc., Richmond
Farallone Packing Co., San Francisco
Fish-Dee-Lish Corp., Richmond
Fish Packers, Inc., McNears Point
Gardenia Packing Co. (*Brookdale*), Richmond
Hofmann Packing Co., McNears Point
W. L. Martignoni (Charterer *Lansing*), Richmond
Northern Packing Corp., San Francisco
Old Capitol Packers, Inc., McNears Point
Ozol Packing Co., Martinez
Pittsburg Canners, Inc., Richmond
Point Edith Fisheries, Ltd., Port Chicago
Polarine Fisheries, Inc., Richmond
Red Rock Fisheries, Inc., Richmond
Redondo Fish Products Co., Richmond
Richmond Fisheries, Inc., Richmond
R. J. Roesling & Co. (Charters *American Fisher*), Richmond
San Pablo Fisheries, Richmond
Santa Inez Fisheries Inc. (*Santa Inez*), Richmond
Western Condensing Co. (*Experimental*), Richmond

[1] Plants burned November 1, 1939.

MONTEREY DISTRICT

F. E. Booth Co., Inc., Monterey
California Packing Corp., Monterey
Carmel Canning Co., Monterey
Custom House Packing Corp., Monterey
Del Mar Canning Co., Monterey
E. B. Gross Canning Co. (2 plants), Monterey
Hovden Food Products Corp. (2 plants), Monterey
Hovden Food Products Corp. (2 plants), Moss Landing
Monterey Canning Co., Monterey
Monterey Fish Products, Inc., (2 plants), Monterey
San Carlos Canning Co. (2 plants), Monterey
San Xavier Fish Packing Co., Monterey
Sea Pride Packing Corp., Ltd., Monterey

SAN PEDRO DISTRICT

California Fisheries, Inc., Long Beach
California Marine Curing & Packing Co., Terminal Island
California Marine Products, Inc., Terminal Island
Coast Fishing Co., Wilmington
Franco Italian Packing Co., Terminal Island
French Sardine Co. of California, Inc., (2 plants), Terminal Island
Italian Food Products Co., Long Beach
Italian Food Products Co., Newport Beach
K & M Fisheries, Terminal Island
Sea Pride Packing Corp., Ltd., Terminal Island
Sea Pride Packing Corp., Ltd., Wilmington
South Coast Fisheries, Inc., Terminal Island
South Pacific Canning Co., Long Beach
Southern California Fish Corp., Terminal Island
Van Camp Sea Food Co., Inc., (3 plants), Terminal Island

SAN DIEGO

American Fisheries Co., San Diego
Fishermen's Tuna Packing Co.,[2] San Diego
Sun Harbor Packing Corp., San Diego
Westgate Sea Products Co., San Diego

[2] Permit issued, no sardines received.

PRODUCTION OF SARDINE PLANTS

August 1, 1939, to March 31, 1940

District	Sardines received, tons	Used for canning, tons	Cannery fish overage used for meal and oil, tons	Used for meal and oil under permit, tons
San Francisco	211,471	14,332	6,869	189,590
Monterey	227,231	88,167	42,351	96,713
San Pedro	93,081	54,242	19,392	17,032
San Diego	95	4		91
Totals	531,878	[1]156,745	68,612	303,426
Add cannery overage used for meal and oil		68,612		
Total tons received for canning purposes		225,357		

[1] The law requires that 13½ cases of 1-lb. oval cans be canned from each ton of sardines received for canning purposes, but in calculating the amount of fish actually used in canning, a basis of 20 cases per ton is used.

District	Cannery offal, tons	1-lb. ovals packed, cases	Other size cans packed, cases	Other size cans reduced to equivalent of 1-lb. ovals, cases	Cases per ton
San Francisco	7,165	196,011	98,296	90,628	13.5
Monterey	44,085	1,092,981	728,612	670,420	13.5
San Pedro	27,124	545,182	558,878	539,666	14.7
San Diego	2		80	80	18.2
Totals	78,376	1,834,174	1,385,866	1,300,794	

District	Sardine meal, tons	Ratio per ton of meal	Sardine oil, gallons	Gallons of oil per ton of fish and offal
San Francisco	36,324	5.6	9,313,706	45.5
Monterey	34,568	5.3	7,090,963	38.7
San Pedro	12,145	5.2	984,851	15.5
San Diego	16	6.2	472	5.0
Totals	83,053		17,389,992	

District	Permits issued, tons	Unused permit tonnage cancelled, tons	Used for other purposes, tons
San Francisco	197,375	7,841	[2]680
Monterey	100,000	3,287	
San Pedro	85,000	67,968	[3]2,415
San Diego	20,000	19,909	
Totals	402,375	99,005	[4]3,095

[2] 680 tons for pet food.
[3] 12 tons for salting, 2,403 tons for pet food.
[4] 3,083 tons for pet food, 12 tons for salting.

COMPARATIVE STATEMENT OF SARDINE PLANT OPERATIONS, SEASONS 1938-39 AND 1939-40

San Francisco District

	Season 1938-39	Season 1939-40	Increase
Tons of sardines received for canning	16,552	21,201	4,649
Tons of sardines received under permit for meal and oil	183,039	189,590	6,551
Tons of sardines received for pet food, etc.	770	680	*90
Total tons of sardines received for all purposes	200,361	211,471	11,110
Cases of 1-lb. oval cans packed	172,454	196,011	23,557
Cases of other size cans packed	60,354	98,296	37,942
Other size cans reduced to equivalent cases of 1-lb. ovals	51,658	90,628	38,970
Meal, tons	34,751	36,324	1,573
Oil, gallons	7,804,909	9,313,706	1,508,797

* Decrease.

Monterey District

	Season 1938-39	Season 1939-40	Increase
Tons of sardines received for canning	78,711	130,518	51,807
Tons of sardines received under permit for meal and oil	101,337	96,713	*4,624
Tons of sardines received for salting, etc.	42		*42
Total tons of sardines received for all purposes	180,090	227,231	47,141
Cases of 1-lb. oval cans packed	687,287	1,092,981	405,694
Cases of other size cans packed	412,872	728,612	315,740
Other size cans reduced to equivalent cases of 1-lb. ovals	376,076	670,420	294,344
Meal, tons	28,859	34,568	5,709
Oil, gallons	5,462,066	7,090,963	1,628,897

* Decrease.

San Pedro District

	Season 1938-39	Season 1939-40	Increase
Tons of sardines received for canning	92,594	73,634	*18,960
Tons of sardines received under permit for meal and oil	50,683	17,032	*33,651
Tons of sardines received for pet food, salting, etc.	2,058	2,415	357
Total tons of sardines received for all purposes	145,335	93,081	*52,254
Cases of 1-lb. oval cans packed	630,998	545,182	*85,816
Cases of other size cans packed	681,597	558,878	*122,719
Other size cans reduced to equivalent cases of 1-lb. ovals	655,303	539,666	*115,637
Meal, tons	22,066	12,145	*9,921
Oil, gallons	2,197,757	984,851	*1,212,906

* Decrease.

San Diego District

	Season 1938-39	Season 1939-40	Increase
Tons of sardines received for canning		4	4
Tons of sardines received under permit for meal and oil	2,790	91	*2,699
Total tons of sardines received for all purposes	2,790	95	*2,695
Cases of 1-lb. oval cans packed			
Cases of other size cans packed		80	80
Other size cans reduced to equivalent cases of 1-lb. ovals		80	80
Meal, tons	537	16	*521
Oil, gallons	37,325	472	*36,853

* Decrease.

California, All Districts Combined

	Season 1938-39	Season 1939-40	Increase
Tons of sardines received for canning	187,857	225,357	37,500
Tons of sardines received under permit for meal and oil	337,849	303,426	*34,423
Tons of sardines received for pet food, salting, etc.	2,870	3,095	225
Total tons of sardines received for all purposes	528,576	531,878	3,302
Cases of 1-lb. oval cans packed	1,490,739	1,834,174	343,435
Cases of other size cans packed	1,154,823	1,385,866	231,043
Other size cans reduced to equivalent cases of 1-lb. ovals	1,083,037	1,300,794	217,757
Meal, tons	86,213	83,053	*3,160
Oil, gallons	15,502,057	17,389,992	1,887,935

* Decrease.

SARDINE CATCH BY MONTHS, SEASON 1939-40

Month	San Francisco			
	Canning	Reduction	Other purposes	Total
August, 1939				
September				
October	4,441	51,742	133	56,316
November	6,722	64,427	209	71,358
December	7,397	67,563	238	75,198
January, 1940	1,126	3,083		4,209
February	1,515	2,775	100	4,390
Totals	21,201	189,590	[1]680	211,471

[1] 680 tons for pet food.

Month	Monterey			
	Canning	Reduction	Other purposes	Total
August, 1939				
September	10,380	13,032		23,412
October	26,034	28,794		54,828
November	32,672	15,954		48,626
December	29,870	22,530		52,400
January, 1940	19,899	10,135		30,034
February	11,663	6,268		17,931
Totals	130,518	96,713		227,231

Month	San Pedro			
	Canning	Reduction	Other purposes	Total
November, 1939	13,616	4,863	488	18,967
December	20,188	5,074	305	25,567
January, 1940	20,525	4,413	476	25,414
February	12,675	1,103	465	14,243
March	6,630	1,579	681	8,890
Totals	73,634	17,032	[2]2,415	93,081

[2] 2,403 tons for pet food, 12 tons for salting.

Month	San Diego			
	Canning	Reduction	Other purposes	Total
November, 1939		71		71
December	4	10		14
January, 1940		10		10
February				
March				
Totals	4	91		95

PACK OF 1-LB. OVALS BY MONTHS, SEASON 1939-40

Month	San Francisco, cases	Monterey, cases	San Pedro, cases	San Diego, cases
August, 1939				
September		89,131		
October	42,421	205,060		
November	63,647	271,331	97,311	
December	70,642	257,405	152,606	
January, 1940	7,476	170,307	150,814	
February	11,825	99,747	102,074	
March			42,377	
Totals	196,011	1,092,981	545,182	

PACK OF OTHER SIZE CANS REDUCED TO EQUIVALENTS OF 1-LB. OVALS, BY MONTHS, SEASON 1939-40

Month	San Francisco, cases	Monterey, cases	San Pedro, cases	San Diego, cases
August, 1939				
September		51,316		
October	17,577	146,481		
November	27,111	169,880	104,439	
December	29,401	145,986	152,360	80
January, 1940	7,905	98,484	136,048	
February	8,634	58,273	97,207	
March			49,612	
Totals	90,628	670,420	539,666	80

SARDINE MEAL PRODUCTION BY MONTHS, SEASON 1939-40

Month	San Francisco, tons	Monterey, tons	San Pedro, tons	San Diego, tons
August, 1939				
September		3,578		
October	9,224	8,484		
November	12,440	7,220	2,577	13
December	13,199	7,961	3,360	2
January, 1940	706	4,519	3,420	1
February	755	2,806	1,684	
March			1,104	
Totals	36,324	34,568	12,145	16

SARDINE OIL PRODUCTION BY MONTHS, SEASON 1939-40

Month	San Francisco, gallons	Monterey, gallons	San Pedro, gallons	San Diego, gallons
August, 1939				
September		775,950		
October	2,514,802	1,726,521		
November	3,159,775	1,594,096	282,266	472
December	3,370,835	1,827,733	322,638	
January, 1940	128,179	789,505	247,781	
February	140,115	377,158	97,061	
March			35,105	
Totals	9,313,706	7,090,963	984,851	472

SARDINE CATCH, CASE PACK, MEAL AND OIL PRODUCTION

For Sardine Packing Seasons

Sardine Catch, Tons

Season	San Francisco district	Monterey district	San Pedro district	San Diego district	Total
1925-26	248	69,011	61,992	5,214	136,465
1926-27	2,653	76,690	64,216		143,559
1927-28	11,066	98,678	67,459	3,973	181,176
1928-29	12,757	119,102	119,180	1,394	252,433
1929-30	20,655	159,434	140,432	2,079	322,600
1930-31	24,468	108,953	38,580		172,001
1931-32	19,938	68,825	42,557		131,320
1932-33	17,417	89,257	83,492		190,166
1933-34	35,467	151,937	124,950	1,488	313,842
1934-35	67,140	229,992	178,755	4,859	480,746
1935-36	74,231	184,113	138,333	10,489	407,166
1936-37	139,429	206,229	137,914	4,569	488,141
1937-38	132,248	104,464	109,015	107	345,834
1938-39	200,361	180,090	145,335	2,790	528,576
1939-40	211,471	227,231	93,081	95	531,878

Sardines, 1-Lb. Ovals, Cases

Season	San Francisco district	Monterey district	San Pedro district	San Diego district	Total
1925-26	3,892	937,014	968,495	66,074	1,975,475
1926-27	51,657	1,150,859	986,858		2,189,374
1927-28	110,911	1,363,251	878,175	39,380	2,391,717
1928-29	114,446	1,405,746	1,140,488	12,383	2,673,063
1929-30	206,478	1,797,566	1,493,615	16,551	3,514,210
1930-31	266,598	1,069,627	403,041		1,739,266
1931-32	269,586	720,518	470,796		1,460,900
1932-33	157,469	253,000	321,794		732,263
1933-34	221,798	748,706	526,540		1,497,044
1934-35	264,805	629,779	591,759		1,486,343
1935-36	336,554	919,497	680,103		1,936,154
1936-37	198,621	818,909	629,802		1,647,332
1937-38	127,214	502,194	553,306		1,182,714
1938-39	172,454	687,287	630,998		1,490,739
1939-40	196,011	1,092,981	545,182		1,834,174

Other Size Cans Reduced to Equivalents of 1-Lb. Ovals, Cases

Season	San Francisco district	Monterey district	San Pedro district	San Diego district	Total
1925-26		35,956	16,361	13,065	65,382
1926-27		21,673	63,264		84,937
1927-28	40,825	14,160	145,143	31,995	232,123
1928-29	69,886	45,778	173,540	10,368	299,572
1929-30	79,224	90,238	458,416	12,552	640,430
1930-31	69,932	176,384	170,388		416,704
1931-32	8,381	43,816	159,066		211,263
1932-33	5,129	10,815	75,775		91,719
1933-34	9,846	113,842	331,631	5,396	460,715
1934-35	12,025	142,535	222,661	13,058	390,279
1935-36	39,597	594,191	627,117	19,856	1,280,761
1936-37	42,986	469,296	819,859	9,573	1,341,714
1937-38	33,763	326,543	756,369	1,040	1,117,715
1938-39	51,658	376,076	655,303		1,083,037
1939-40	90,628	670,420	539,666	80	1,300,794

Sardine Meal, Tons

Season	San Francisco district	Monterey district	San Pedro district	San Diego district	Total
1925-26	20	6,393	5,962	467	12,842
1926-27	228	6,447	5,962	----	12,637
1927-28	1,183	9,355	7,128	184	17,850
1928-29	1,387	12,395	14,802	140	28,724
1929-30	2,282	16,671	16,258	251	35,462
1930-31	2,716	11,490	4,317	----	18,523
1931-32	2,303	7,825	4,911	----	15,039
1932-33	2,297	14,370	14,060	----	30,727
1933-34	5,073	22,206	19,166	262	46,707
1934-35	10,571	36,396	29,836	848	77,651
1935-36	11,604	26,933	19,422	1,945	59,904
1936-37	23,686	31,867	18,735	827	75,115
1937-38	23,058	15,383	14,525	15	52,981
1938-39	34,751	28,859	22,066	537	86,213
1939-40	36,324	34,568	12,145	16	83,053

Sardine Oil, Gallons

Season	San Francisco district	Monterey district	San Pedro district	San Diego district	Total
1925-26	2,629	1,110,983	658,817	43,995	1,816,424
1926-27	60,967	1,501,384	682,796	----	2,245,147
1927-28	257,989	1,601,993	711,579	10,253	2,581,814
1928-29	288,055	2,651,524	2,178,815	6,857	5,125,251
1929-30	474,530	3,887,472	1,986,704	11,071	6,359,777
1930-31	763,643	3,363,912	630,011	----	4,757,566
1931-32	612,181	2,143,101	762,701	----	3,517,983
1932-33	574,958	3,761,387	2,161,476	----	6,497,821
1933-34	1,175,401	4,819,900	3,242,899	24,303	9,262,503
1934-35	2,514,588	9,379,239	4,865,486	111,252	16,870,565
1935-36	3,196,286	6,854,372	2,939,863	210,171	13,200,692
1936-37	5,509,905	6,814,184	1,898,134	77,700	14,299,923
1937-38	4,659,147	3,067,587	1,447,631	912	9,175,277
1938-39	7,804,909	5,462,066	2,197,757	37,325	15,502,057
1939-40	9,313,706	7,090,963	984,851	472	17,389,992

Sardine Oil Production, Gallons Per Ton

Season	San Francisco district	Monterey district	San Pedro district	San Diego district
1930-31	47.5	43.2	26.3	----
1931-32	47.1	43.1	28.5	----
1932-33	43.0	45.6	29.1	----
1933-34	39.6	37.0	31.3	17.7
1934-35	41.7	44.5	30.7	24.7
1935-36	49.9	46.8	27.9	21.0
1936-37	41.3	39.1	18.9	17.9
1937-38	36.3	36.6	19.3	11.1
1938-39	40.2	35.6	19.8	13.4
1939-40	45.5	38.7	15.5	5.0

CASE PACK, MEAL AND OIL PRODUCTION FOR CALENDAR YEARS 1928-1939

Sardines, 1-Lb. Ovals, Cases

Year	San Francisco district	Monterey district	San Pedro district	San Diego district	Total
1928	109,198	1,402,237	945,676	39,755	2,496,966
1929	204,878	1,834,648	1,438,159	12,225	3,489,910
1930	237,159	1,342,249	863,254	15,500	2,458,162
1931	307,575	696,640	498,996	----------	1,503,211
1932	125,737	334,019	415,874	----------	875,630
1933	239,917	598,616	365,750	----------	1,204,283
1934	292,216	798,942	531,619	----------	1,622,777
1935	301,455	825,011	615,808	----------	1,742,274
1936	225,185	864,498	586,038	----------	1,675,721
1937	101,912	577,405	761,776	----------	1,441,093
1938	164,559	556,477	600,532	----------	1,321,568
1939	225,462	1,023,285	627,524	----------	1,876,271

Fish Meal, Tons

Year	San Francisco district	Monterey district	San Pedro district	San Diego district	Total
1928	1,589	10,986	12,923	2,367	27,865
1929	2,576	16,640	20,040	3,565	42,821
1930	3,375	13,752	13,653	4,859	35,639
1931	3,597	8,416	7,600	2,827	22,440
1932	2,435	12,560	9,846	2,659	27,500
1933	4,941	18,869	18,249	4,310	46,369
1934	11,138	34,492	27,236	4,858	77,724
1935	12,994	27,966	31,163	6,572	78,695
1936	24,593	30,431	23,588	7,655	86,267
1937	22,916	21,118	29,184	8,300	81,518
1938	31,773	25,202	24,209	6,732	87,916
1939	43,369	33,238	21,858	6,704	105,169

Includes meal produced from sardines and other species of fish.

Fish Oil, Gallons

Year	San Francisco district	Monterey district	San Pedro district	San Diego district	Total
1928	282,043	2,174,673	1,268,518	24,068	3,749,302
1929	454,726	3,750,392	2,280,991	62,017	6,548,126
1930	747,931	3,769,950	1,282,893	41,989	5,842,763
1931	726,514	2,372,303	818,364	7,511	3,924,692
1932	426,831	3,378,929	1,293,961	25,678	5,125,399
1933	933,696	4,209,366	2,585,784	58,948	7,787,794
1934	2,490,156	9,322,080	4,221,447	94,525	16,128,208
1935	3,106,785	6,734,305	3,821,566	261,482	13,924,138
1936	5,626,422	6,756,541	2,834,887	260,059	15,477,909
1937	4,431,668	4,122,817	2,578,600	191,757	11,324,842
1938	7,032,792	4,753,160	2,126,661	130,606	14,043,219
1939	10,395,398	6,894,201	1,594,122	96,806	18,980,527

Includes oil produced from sardines and other species of fish.

STATE OF CALIFORNIA

DEPARTMENT OF NATURAL RESOURCES

DIVISION OF FISH AND GAME

San Francisco, California

CULBERT L. OLSON---GOVERNOR
RICHARD SACHSE---DIRECTOR OF NATURAL RESOURCES

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Brian Curtis, Senior Fisheries Biologist---Sacramento
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Richard S. Croker, Senior Fisheries Researcher---Terminal Island
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Paul Bonnot, Senior Fisheries Researcher---Stanford University
S. Ross Hatton, Senior Fisheries Researcher---Stanford University
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Geraldine Conner, Fisheries Statistician---Terminal Island

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Samuel Kabakov, Junior Engineering Aid---San Francisco
Emmert Lippincott, Junior Engineering Aid---San Francisco

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L. O'Leary, License Agent---Sacramento
O. Coleman, License Agent---San Francisco
R. Nickerson, License Agent---Los Angeles

BUREAU OF PATROL

E. L. MACAULEY, Chief of Patrol ..... San Francisco

CENTRAL DISTRICT (Headquarters, Sacramento)

LaRue Chappell, Inspector in Charge ..... Sacramento

Northern Division

A. A. Jordan, Captain ..... Redding
Jos. H. Sanders, Captain ..... Sacramento
A. H. Willard, Captain ..... Nevada City
E. O. Wraith, Captain ..... Susanville
L. E. Mercer, Warden, Butte County ..... Chico
Taylor London, Warden, Colusa County ..... Colusa
Albert Sears, Warden, El Dorado County ..... Placerville
E. C. Vail, Warden, Glenn County ..... Willows
Don Davison, Warden, Modoc County ..... Alturas
Earl Hiscox, Warden, Nevada County ..... Nevada City
Wm. La Marr, Warden, Placer County ..... Tahoe City
Nelson Poole, Warden, Placer County ..... Auburn
E. J. Johnson, Warden, Plumas County ..... Quincy
J. E. Hughes, Warden, Sacramento County ..... Sacramento
H. S. Vary, Warden, Sacramento County ..... Sacramento
Eugene Durney, Assistant Warden, Sacramento County ..... Sacramento
Earl Caldwell, Warden, Shasta County ..... Burney
Chas. Love, Warden, Shasta County ..... Redding
Don Chipman, Warden, Siskiyou County ..... Dunsmuir
Brice Hammack, Warden, Siskiyou County ..... Yreka
Fred R. Starr, Warden, Siskiyou County ..... Dorris
R. E. Tutt, Warden, Sierra County ..... Downieville
A. Granstrom, Warden, Sutter County ..... Yuba City
R. W. Anderson, Warden, Tehama County ..... Red Bluff
C. L. Gourley, Warden, Trinity County ..... Weaverville
C. O. Fisher, Warden, Yolo County ..... Woodland
R. A. Tinnin, Warden, Yuba County ..... Browns Valley

Southern Division

S. R. Gilloon, Captain ..... Fresno
John O'Connell, Captain ..... Stockton
R. J. Little, Warden, Amador County ..... Pine Grove
L. R. Garrett, Warden, Calaveras County ..... Murphys
F. A. Bullard, Warden, Fresno County ..... Reedley
Paul Kehrer, Warden, Fresno County ..... Fresno
Lester Arnold, Warden, Kern County ..... Bakersfield
C. S. Donham, Warden, Kern County ..... Kernville
Ray Ellis, Warden, Kings County ..... Hanford
H. E. Black, Warden, Madera County ..... Madera
Gilbert T. Davis, Warden, Mariposa County ..... Mariposa
M. S. Clark, Warden, Merced County ..... Merced
R. J. Bullard, Warden, San Joaquin County ..... Tracy
Wm. Hoppe, Warden, San Joaquin County ..... Lodi
Geo. Magladry, Warden, Stanislaus County ..... Modesto
W. I. Long, Warden, Tulare County ..... Visalia
Roswell Welch, Warden, Tulare County ..... Porterville
F. F. Johnston, Warden, Tuolumne County ..... Sonora

COAST DISTRICT (Headquarters, San Francisco)

K. P. Allred, Inspector in Charge ..... San Francisco

Northern Division

W. J. Harp, Captain ..... Ukiah
J. D. Dondero, Captain ..... Lakeport
Henry Lencioni, Captain ..... Santa Rosa
Ray Diamond, Warden, Del Norte County ..... Crescent City
John Hurley, Warden, Humboldt County ..... Eureka
W. F. Kaliher, Warden, Humboldt County ..... Fortuna
Scott Feland, Warden, Lake County ..... Lakeport
R. J. Yates, Warden, Marin County ..... San Rafael
Ovid Holmes, Warden, Mendocino County ..... Fort Bragg
Leo Mitchell, Warden, Mendocino County ..... Point Arena
R. Remley, Warden, Mendocino County ..... Willits
J. W. Harbuck, Warden, Napa County ..... Napa
Bert Laws, Warden, Sonoma County ..... Petaluma
Victor Von Arx, Warden, Sonoma County ..... Santa Rosa

Southern Division

O. P. Brownlow, Captain—Alameda
C. L. Bundock, Warden, Alameda County—Oakland
Ed Clements, Warden, Contra Costa County—Martinez
Owen Mello, Warden, Monterey County—Pacific Grove
Orben Philbrick, Warden, Monterey County—King City
F. H. Post, Warden, Monterey County—Salinas
J. P. Vissiere, Warden, San Benito County—Hollister
Lee C. Shea, Warden, San Francisco County—San Francisco
F. W. Hecker, Warden, San Luis Obispo County—San Luis Obispo
C. R. Peek, Warden, San Mateo County—San Mateo
C. E. Holladay, Warden, Santa Clara County—San Jose
F. J. McDermott, Warden, Santa Cruz County—Santa Cruz

SOUTHERN DISTRICT (Headquarters, Los Angeles)

C. S. Bauder, Inspector in Charge—Los Angeles
E. H. Ober, Captain, Special Duty—Los Angeles

Western Division

Earl Macklin, Captain—Summerland
L. T. Ward, Captain—Escondido
Fred Albrecht, Warden, Los Angeles County—Los Angeles
Walter Emerick, Warden, Los Angeles County—Palmdale
Theodore Jolley, Warden, Los Angeles County—Los Angeles
John Spicer, Warden, Los Angeles County—Los Angeles
J. W. Thornburg, Warden, Los Angeles County—Los Angeles
W. L. Hare, Warden, Riverside County—Hemet
E. H. Glidden, Warden, San Diego County—San Diego
Walter Shannon, Warden, San Diego County—Julian
A. R. Ainsworth, Warden, Santa Barbara County—Santa Maria
R. E. Bedwell, Warden, Santa Barbara County—Santa Barbara
G. N. Johnson, Warden, Ventura County—Ventura

Eastern Division

H. C. Jackson, Captain—San Bernardino
W. S. Talbott, Warden, Inyo County—Bishop
C. J. Walters, Warden, Inyo County—Independence
Al Crocker, Warden, Mono County—Bridgeport
Charles Mayfield, Warden, Orange County—Orange
W. C. Blewett, Warden, Riverside County—Indio
R. C. O'Conner, Warden, Riverside County—Banning
A. L. Stager, Warden, San Bernardino County—Upland
W. C. Malone, Warden, San Bernardino County—San Bernardino
James Loudagin, Warden, San Bernardino County—Big Bear Lake

MARINE PATROL

C. H. Groat, Inspector in Charge—Terminal Island
Ralph Classic, Captain—Monterey
Lars Weseth, Master, M. V. *N. B. Scofield*—Terminal Island
Walter Engelke, Master, M. V. *Bluefin*—Terminal Island
Howard V. Shebley, Warden, Cruiser *Bonito*—Santa Barbara
John Barry, Assistant Warden, Cruiser *Bonito*—Santa Barbara
———, Warden, Cruiser *Broadbill*—San Diego
Kenneth Webb, Assistant Warden, Cruiser *Broadbill*—San Diego
Donald Glass, Warden, Cruiser *Marlin*—Santa Monica
Niles Millen, Assistant Warden, Cruiser *Marlin*—Santa Monica
Charles Sibeck, Warden, Launch *Perch*—Sacramento
L. M. Booth, Assistant Warden, Launch *Perch*—Sacramento
Kenneth Hooker, Warden, Cruiser *Quinnat III*—San Francisco
Richard Hardin, Assistant Warden, Cruiser *Quinnat III*—San Francisco
K. Lund, Assistant Warden, Launch *Sturgeon*—Martinez
Carmi Savage, Warden, Cruiser *Tuna*—Avalon
Phillip Westcott, Assistant Warden, Cruiser *Tuna*—Avalon
E. R. Hyde, Warden, Cruiser *Yellowtail*—Balboa
L. R. Metzgar, Assistant Warden, Cruiser *Yellowtail*—Balboa
W. J. Black, Warden—Monterey
E. A. Chan, Warden—Terminal Island
Erol Greenleaf, Warden—Terminal Island
Lester Golden, Warden—Arroyo Grande
N. C. Kunkel, Warden—Terminal Island
Leslie E. Lahr, Warden—Eureka
Ralph Miller, Warden—San Francisco
Tate F. Miller, Warden—Terminal Island
T. W. Schilling, Warden—Terminal Island
G. R. Smalley, Warden—Richmond
T. J. Smith, Warden—San Diego
L. G. Van Vorhis, Warden—Terminal Island
E. L. Walker, Warden—Terminal Island

POLLUTION DETAIL

Paul Shaw, Chemist in Charge ..... San Francisco
C. L. Towers, Warden ..... Los Angeles
Jack McKerlie, Warden ..... Oakland
J. A. Reutgen, Assistant Warden, Launch *Rainbow* ..... Stockton
R. Schoen, Warden ..... Terminal Island
Clarence Whaley, Assistant Warden ..... Long Beach
Don Hall, Assistant Warden ..... Santa Barbara

CALIFORNIA JUNIOR GAME PATROL

M. F. Joy, Warden, Superintendent Junior Game Patrol ..... San Francisco
Geo. D. Seymour, Assistant, Junior Game Patrol ..... San Francisco

MARINE PATROL AND RESEARCH

Motor Vessel *N. B. Scofield*, Terminal Island
Motor Vessel *Bluefin*, Terminal Island
Cruiser *Yellowtail*, Newport Harbor
Cruiser *Broadbill*, Santa Monica
Cruiser *Quinnat III*, San Francisco
Cruiser *Bonito*, Santa Barbara
Cruiser *Marlin*, San Diego
Cruiser *Tuna*, Avalon
Launch *Rainbow*, Stockton
Launch *Shrapnel*, Lakeport
Launch *Sturgeon*, Martinez
Launch *Perch*, Sacramento

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